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Railway Age

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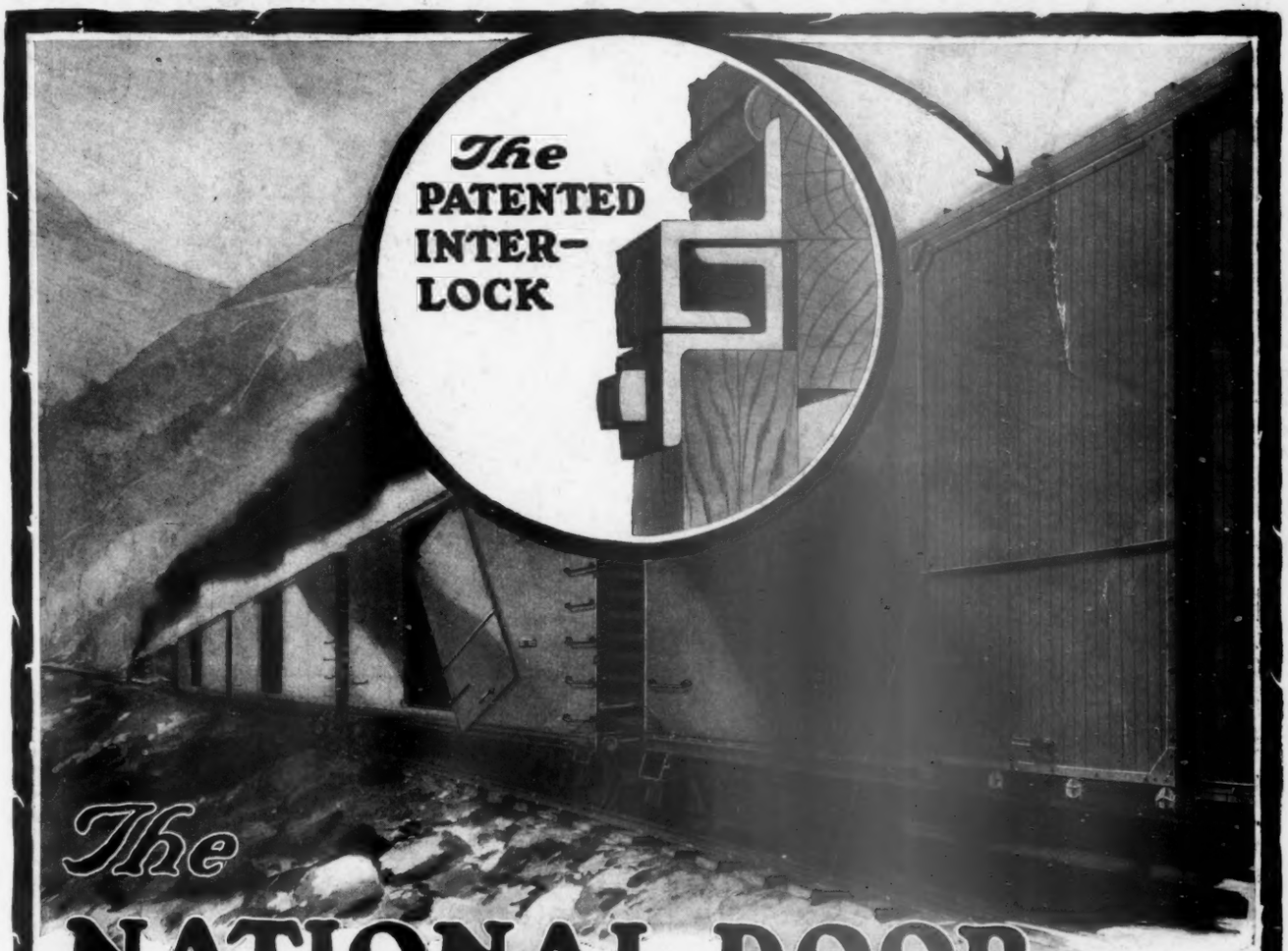

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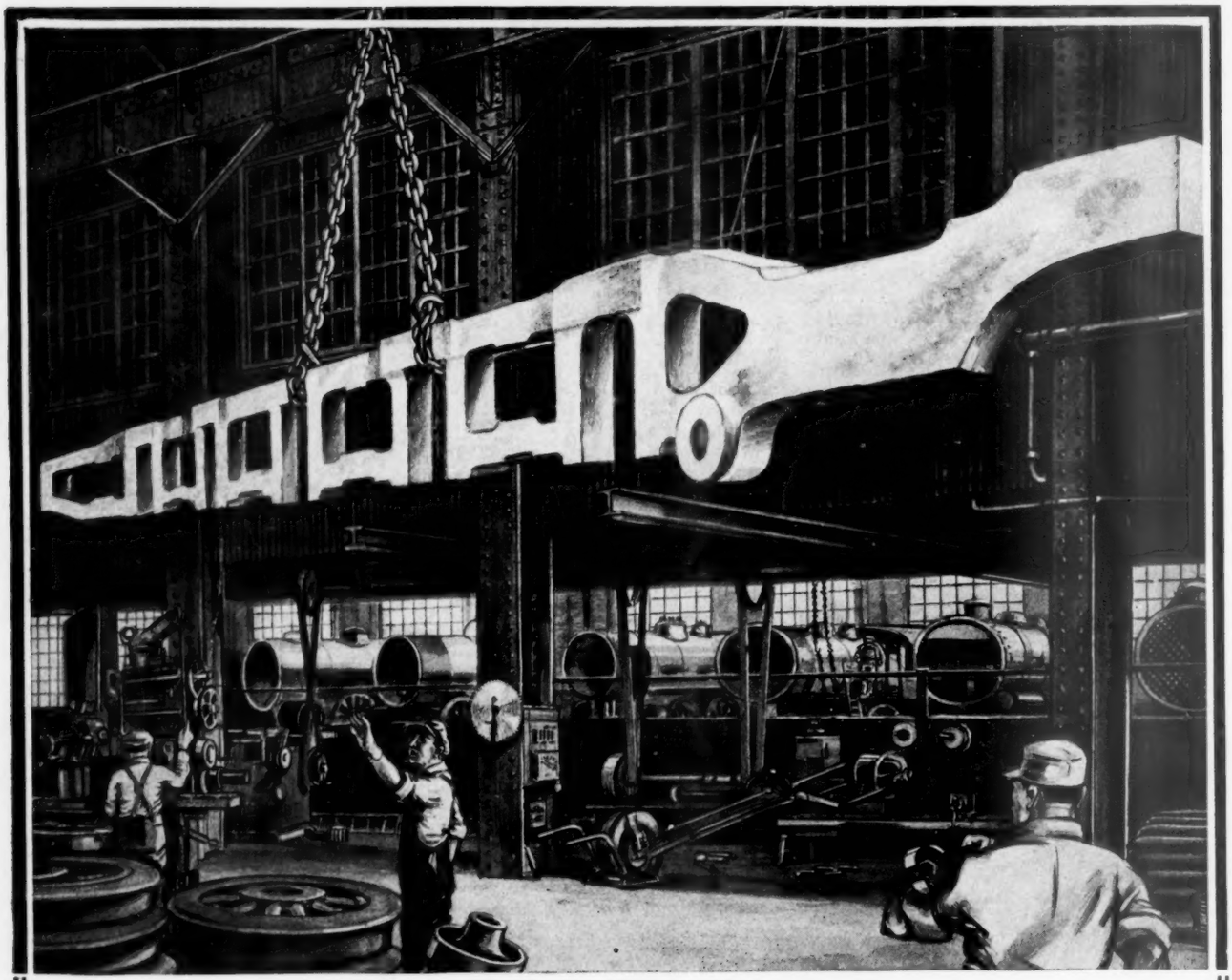

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EDITORIAL

Railway Age

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It would seem a fairly safe guess that if an observer wanted to find the real center of optimism in the United States in these times of business depression, he would save his time by starting his search at El Paso, Houston or at some of the other leading commercial centers along the Mexican border. It has been so long since conditions in Mexico were such, politically and commercially, that trade with that country could be carried on with facility, that we have almost forgotten how large Mexico really is or how great are its possibilities of trade and development. Conditions south of the Rio Grande are now, however, much happier than they were. The Mexican government has shown that it realizes the necessity of putting its transportation system back on a proper basis and there is no doubt that the agreement made with a number of American roads for the loan of cars and locomotives should prove of much benefit to that end. The effect, however, will not be all on the Mexican side of the border, for it is apparent that the American roads north of the border as well as the jobbing centers served by them will be benefited to an equal if not to a greater extent. These roads are in fact in the position of being prepared for the opening of a new country of great traffic possibilities and their earnings will presumably reflect that fact in coming months.

Traffic to Mexico

The situation existing in China today, which is being brought to the attention of the American people by the Committee for the Chinese Famine Fund, is one that has many serious aspects outside of the necessity for charity. The facts are that China in her five northern provinces is suffering from the worst famine in her history and perhaps in all recorded history. In an area of some 100,000 square miles, 45,000,000 are threatened with famine; 15,000,000 are literally starving and the reports tell us that deaths from starvation and disease are occurring at a rate of 10,000 a day. The reason for all this misery is that continuous drought for eighteen months has caused the failure of three successive crops. China is not a poor country; it has much wealth, although of a potential character, and its agricultural possibilities are not small. We are told, for example, that food in abundance can be purchased in Manchuria. The chief difficulty in China is that it lacks transportation and has not reached that stage of economic agricultural development that goes with the building of railway lines and highways. Each agricultural community presumably is in a measure an economic entity in itself. Such a community is not developed to the point where it can raise a surplus nor would it be worth while for it to raise such a surplus, because it could not dispose of it. China proper, exclusive of Mongolia and Tibet, has an area of 1,532,420 square miles and a population of over 300,000,000 as compared with an area of 2,973,890 in the United States and a population of 105,000,000. To serve its large area and enormous population China has but 6,000 miles of railway lines. It is plain enough that the need for assistance in the present emergency is most urgent, but it is equally plain that to avoid a recurrence of such disastrous conditions as exist at present, China needs new railways and lots of them. It is certainly to be hoped that the eyes of the rest of the world will be opened to that fact, to the end that the many projects and proposals for extended railway development to make available China's great potential wealth may become actualities with less delay through international politics, diplomatic discussion and jealousy.

A Country Without Railways

Several American financial institutions, known in financial circles as the "South American group," are offering to the public $24,000,000 of 8 per cent gold, sinking fund bonds of the government of Chile. It is understood that the proceeds of this loan will be expended for the most part in this country in the purchase of equipment and supplies for the government railways. It is not proposed to expend any of these funds for the building of new lines but rather to use them for the rehabilitation of the present sections of the government system. The largest purchases by the railways will probably be rolling stock and locomotives, since Chile's present supply of this equipment is known to be inadequate. Aside from the fact that this loan will presumably result in orders for equipment and supplies for American manufacturers, it is interesting from another angle, since it is Chile's custom, as a general rule, to place these loans in London. In fact, it has been reported that an attempt was made in the present instance to place this loan in Great Britain, but that our bankers were able to offer more favorable terms than those in London. It is to be hoped that the New York market for such securities will be receptive. If it is, large loans to Argentina and Brazil will probably be placed here. The result will be a tendency to correct the unfavorable exchange situation and make it easier for American exporters to compete with foreign competitors, besides assuring certain definite purchases from the proceeds of the loans themselves.

Chile Borrows $24,000,000

The Coal Trade Journal says that the railroads have used the assigned car as a club to "beat down" the price of locomotive fuel. If it was possible to "beat down" the price of coal to 20 dollars a ton in New England last year, what would the railroads have paid had it not been for assigned cars? If it was necessary to confiscate thousands of tons of commercial coal during the previous year in order to keep the railroads running, how enormous would have been these confiscations had not the assigned car assured a certain fixed supply? If hundreds of cars shipped to the railroads during recent years contained coal that was unfit for locomotive use, what would have happened had it not been possible for the railroads to place assigned cars at mines where they were assured a suitable grade of coal? The railroads did accept great quantities of inferior coal but this does not indicate, as claimed by the Coal Trade Journal, that this coal was acceptable. *Inferior coal was never acceptable,* but the railroads took it in order to avoid confiscating commercial coal and to keep running. When the Boston & Maine recently

Accepted Coal Not Always Acceptable

rejected 400 cars of inferior coal it did not sell this coal to the Commonwealth of Massachusetts on competitive bids as stated by the Coal Trade Journal, but even if it had done so it would not have proved the coal to be fit for locomotive use. Furthermore, contrary to the statement in the Coal Trade Journal, the "one shipper" who voluntarily admitted that this rejection was justifiable was, as a matter of fact, involved in the original transaction for which that publication first attacked the railroad.

Selection and Training of Foremen

It is difficult to find an argument not already advanced for the more careful selection and training of railroad shop foremen. The present situation, however, warrants a reconsideration of these arguments. Efficient, capable foremen could overcome to a certain extent the effect of indifferent workmen but far too few efficient, capable foremen are available. Failure to select and train carefully an adequate number of these men in the past is now costing the railroads dearly. Four years are considered necessary for an apprentice to learn the machinist's trade and yet a machinist is promoted to the position of foreman, directing men instead of machines, and is expected to make good in four weeks or less. The selection of men for prospective foremen should not be left to chance, as past experience has amply demonstrated the possibility of keeping personal efficiency records whereby the master mechanic, or shop superintendent, is enabled to tell at a glance which one of his employees will probably best fill a vacancy among the foremen. Incidentally, this system tones up the whole organization since it enables those in authority to know the work for which each employee is best adapted, and to encourage him to overcome individual weaknesses. Conceding the need for the careful selection of prospective foremen, the best and practically the only method of training them is by affording actual experience in directing the work of others. Every possible opportunity should be given ambitious, promising employees to work as acting foremen in the various departments, taking advantage of the absence of regular foremen on account of sickness, vacation or other cause. This will allow the man to break in under the guidance of more experienced foremen. Trying out a man as acting foreman affords a graceful means of returning him to the ranks should he not make good, thus avoiding the undesirable consequences of demoting him. The acting foreman should be coached carefully and be encouraged by his superiors to assign all possible detail work to subordinates, devoting themselves to the broader problems of managing departments, installing improved methods and developing team work and enthusiasm in the men who are under their direction.

British Railways in Argentina

As regards railways, Argentina is more intensively developed in proportion to its population than is our own country. There are 28 miles of line for each 10,000 inhabitants in that country—as against 25 miles for each 10,000 of population in the United States. The total railway mileage of Argentina is approximately 20,370—something over 75 per cent of which is owned by British capitalists and operated by railway men from the British Isles. That these Britons have done and are doing their work well is amply testified by an article elsewhere in this issue—the first one of a series of three which will deal with the railways of Argentina. These articles propose to describe in some detail the extent to which these roads are developed by their British managers and to give a general idea of some of the practices and equipment of the lines. The penchant of British railway managers to buy British equipment and supplies is well known. The fact that Argentina is not one of the most promising markets for American railway supplies, therefore, scarcely needs to be commented upon. The lines not owned by the British, approximately 5,000 miles, of course offer opportunities for orders to the American concerns which can, in spite of the unfavorable exchange situation, meet the prices of foreign competitors. The strength of the British position in Argentina bears eloquent testimony to the truism that "trade follows the invested dollar." Argentina is growing rapidly and such growth will soon necessitate great increases in railway mileage. The answer to America's foreign trade difficulties in the Argentine, then, is the investment of capital in the enterprises of the country. A loan of $24,000,000 has, according to press reports, just been arranged in this country for the Chilean government to aid in the rehabilitation of the Chilean railways. Such a loan, besides assuring certain definite purchases in this country, facilitates general buying in America because it tends to correct the disadvantageous exchange situation. A similar loan to Argentina is said to be under consideration. If the report is true the opportunity exists for taking a decided step in the right direction.

Brown's Discipline on the Canadian Pacific

Discipline without suspension is not discipline at all unless it is managed systematically and one of the points used in arguments against the Brown system is that small offenses cannot be or at least are not, carefully weighed, recorded and made to take their proper place in the summing up of merits and demerits by which a man is finally judged. From a recent monthly record of one district of the Canadian Pacific we copy some entries giving evidence that this criticism is not in all cases justified:

Extracts from Record of Demerits, January, 1921

1 Conductor	10 Demerit marks..	Not seeing that his trainman was in his proper position, on passenger train, to cut engine off train on arrival at terminal.
1 Conductor	20 Demerit marks..	Not reporting an occurrence in tourist car on his train, after same had been called to his attention.
2 Conductors	20 Demerit marks..	Carrying an ex-employee on their train without transportation.
1 Conductor	20 Demerit marks..	Failing to register train at end of double track; two offenses.
1 Conductor	15 Demerit marks..	Overcarrying an elderly lady who was traveling in day coach on his train.
1 Sec. foreman..	10 Demerit marks..	Worked unnecessary overtime.
1 Sec. foreman..	30 Demerit marks..	Not completing patrol of section on morning inspection, having to send one of his men over same territory twice; wasting time unnecessarily.
1 Trainman	20 Demerit marks..	Sleeping on duty while approaching terminal on passenger train, and not being on hand to cut engine off train.
1 Trainman	10 Demerit marks..	Repeatedly failing to present watch for comparison.
1 Yardman	5 Demerit marks..	Not uncoupling air hose on cars before starting switching operations.

These and other items in the record indicate that "Brownies" can be made to fit the offense, without difficulty, if the superintendent is determined to do justice. It is not possible of course to make comparisons with certainty at this distance; but where entries are put into the record for such minor faults as lack of promptness in cutting off an engine, or wasting an hour's time of a few laborers, or failing to report an incident (in a passenger car) which was of questionable moment, one may feel confident that discipline is being administered with discrimination and care. It is for those who would discredit "book discipline" to set forth how such offenses would be dealt with effectively under the old system. Would they not very likely be turned off with an admonition or a reprimand which would never be mentioned in the record? "Be fair and you can be firm." This well-settled maxim works both ways. The officer who does not carefully make record of the smaller offenses is not fair to the

employer. Having made such record he is the better prepared to be generous—intelligently generous—to the employee, whenever generosity may seem to be advisable.

A Check on Locomotive Development

The rapid growth in the aggregate hauling capacity of railroad motive power, amounting to an increase of 150 per cent in the last 17 years, has heavily overloaded the available maintenance facilities. The effect which the shortage of facilities seems to have had on the serviceability of locomotives was suggested in an article appearing in last week's issue in which it was pointed out that since 1903 there has been a decrease in the annual train miles per locomotive now equivalent to two months' service in 12. But there is another aspect of this situation which may prove even more serious in the future than the decrease in locomotive mileage. Appliances designed to increase the efficiency or the capacity of the locomotive as a power producer, or to facilitate its operation, generally add to the volume of maintenance work. In few cases can the operating economies or other advantages of these appliances be fully realized if their care is neglected. But it is not infrequently necessary to keep the locomotive in operation at the expense of neglecting these appliances in order to do the work which must be performed if the locomotive is to move at all. Such conditions result in failure to realize a full return from these important features of the modern locomotive, a loss of economy not only detrimental in itself but inevitably tending to check the development and practical application of all such improvements. One railroad officer has expressed the opinion that it is useless to consider the application of additional devices to the locomotives on his road until it is possible to maintain adequately the equipment as it now exists. The inability to take advantage of every practical development for increasing locomotive efficiency may readily become even more serious than reduced locomotive serviceability unless a reasonable balance between shop and terminal facilities and the amount and character of equipment to be cared for is restored. If $100,000,000 to $200,000,000 be accepted as an approximation of the investment in idle locomotives required to offset the reduction in mileage performance which has taken place since 1903, the failure to realize a possible saving averaging only two or three per cent on the railroad fuel bill would cause a loss on this item alone as great as the carrying charges on the unproductive investment. From whatever angle this subject is approached, it is evident that the provision of adequate shop and terminal facilities is as important and inseparable a part of the motive power problem as the locomotive itself.

The Labor Board's Decision

THE DECISION rendered by the Railroad Labor Board on February 17 on General Atterbury's suggestions to it has been interpreted as a defeat for the railroads. However that may be, the decision establishes certain precedents which, if the board scrupulously follows them in future, will promote orderly procedure and fairness in the handling of matters over which it has jurisdiction.

One suggestion which was made by General Atterbury, speaking as chairman of the Labor Committee of the Association of Railway Executives, was that the board should approve at once the restoration of the rules and working conditions in effect on each railroad on December 31, 1917. He pointed out that the financial situation of many railways, due to an excessive pay roll and the heavy decline of traffic, was becoming very serious. Spokesmen of the labor unions immediately replied that the board could not regulate wages and working conditions according to the financial condition of the companies—that the needs of the railways was a matter to be determined by the Interstate Commerce Commission, and that the board's authority extended only over wages, rules and working conditions. The Labor Board, in its decision, recognized that while its authority extends only to fixing reasonable wages and working conditions, it cannot ignore the fact that rules and working conditions affect operating expenditures, and that unreasonable rules and working conditions must impose an undue burden upon the railroads and the public. At the same time, however, it said that the general condition and needs of the railways were matters not for its consideration, but that of the Interstate Commerce Commission.

In effect the board refused to accept facts regarding the financial condition of the railways as evidence having any bearing upon the reasonableness of rules and working conditions. But the board cannot consistently refuse to accept evidence regarding the financial condition of the railroads as having a bearing upon the reasonableness of rules and working conditions, and at the same time allow the labor leaders to take up hours and days of its time with charges, or even evidence, to the effect that the railroads are financially controlled by a few banking houses, that they have wasted money by having repairs to locomotives and cars made in outside plants, and that they are engaged in a conspiracy to break up the labor unions. If the financial condition of the railroads has no bearing on the subject of rules and working conditions, then certainly the sort of Plumb plan propaganda with which the brotherhood leaders have been deluging the board has no bearing upon it. If the board will in future, as its decision indicates, strictly confine those appearing before it to evidence and arguments regarding only the matters over which it has jurisdiction—that is, railway rules, working conditions and wages—its hearings will become solely a means to the rational settlement of the questions over which it has jurisdiction, instead of so largely a vehicle for the airing of wild, reckless and scandalous misrepresentations by the labor leaders.

The board refused to accept General Atterbury's suggestion that it immediately authorize the railways to pay the current wages for unskilled labor upon the ground that no controversy between any railway and its employees upon this subject had properly and legally been brought before it. It is undoubtedly in accordance with the spirit of the Transportation Act that no question shall be brought before the board which has not previously been the subject of conference and become a matter of controversy between the railways and their employees. But while this is the spirit and even the letter of the Transportation Act, it has not always been recognized by the board itself, and has in some cases been completely ignored by the labor unions. The railways individually have desired to negotiate with their own employees regarding every difference arising between them. The labor unions have tried to manoeuvre matters so as to force all negotiations to be carried on by the national labor organizations and the railroads as a whole. They forbade their local chairmen to negotiate at all with individual railways regarding the continuance of the present national agreements, rules and working conditions. The result was that jurisdiction of these agreements, rules and working conditions was taken by the Labor Board practically without any such previous conferences being held, and controversies arising regarding them, as are contemplated by the Transportation Act.

It will be best for all concerned in the long run that every reasonable effort shall be made by the individual railways and their own employees to settle all disputes arising between them before they are carried to the Labor Board. If the board should begin at once to make itself a court of original jurisdiction, instead of a court of appeal, all hope of having a large portion of labor disputes settled locally without its intervention would be destroyed. But here again the board

must recognize the principle that what is sauce for the goose is sauce for the gander. Having refused to allow the railways to make it a court of original jurisdiction, consistency will require it in future to refuse to allow the labor leaders to bring before it any matter which has not first been taken up with the managements of the railways.

Railway employees opposed the passage of the labor provisions of the Transportation Act. They sought at the national election the defeat of every member of Congress who voted for it. Now, in a period of declining prices and wages, they are finding and using it as a protection to them. But for the labor provisions of the Transportation Act, practically all the railways of the country would today be paying much less for unskilled labor than they are. It is to be hoped that in future, when the Transportation Act may serve as a protection to the railway companies, the employees will not forget the benefits they are now deriving from it.

Meantime, it is highly desirable that the railway companies shall comply with all the provisions of the Act, in letter and in spirit. While it is now protecting labor, the time will come, if it is not broken down, when it will protect the railways. It would be very unfortunate if the railways in the present period of stress should break it down and thereby deprive themselves of the protection which, under different conditions, it would afford to them. The railway companies should be at least as consistent and law-abiding as they demand that labor shall be.

The Labor Board's Responsibility

THE RAILWAYS in many parts of the country are now in the somewhat unusual position (for them) of paying considerably more than the prevailing wages for unskilled labor in many localities. Because of this fact and prompted by the urgent necessity for a reduction of expenses, certain roads have taken it upon themselves to announce reductions in these rates. In its reply to the suggestion presented by General Atterbury for immediate reductions of the wages of unskilled labor the Labor Board stated that the question was not properly before it for consideration and indicated the manner in which it must be brought before it. On February 14, it further ordered one of the roads which had announced a reduction in wages to rescind it, and set a date for a hearing on this question. The entire matter will be thrashed out before the board in the very near future.

In passing on this question the Labor Board bears a peculiar responsibility to the public because of the fact that the wages in question are now higher than those paid by competing industries and because of the amount of money now involved and the even larger amount which will be involved when the more intensive season of maintenance of way work opens. While this question has been raised with reference to all unskilled labor it relates principally to that employed in maintenance of way work where probably 300,000 men are now enrolled, this number increasing to over 400,000 in the summer. At the present time the wages for such labor are fixed at rates ranging from 40 cents to 48½ cents per hour with time and one-half after eight hours, a large part of the men receiving the highest rate. In contrast, unskilled labor of the class employed in railway service can now be secured in large quantities in many places at from 10 to 15 cents per hour less than is now being paid by the roads, and is being employed at these lower rates by contractors and other industries without penalty overtime. It is therefore evident that the railways are now paying over $250,000 more each working day than is necessary to secure the needed labor.

While the law creating the Labor Board outlines those conditions which must be given major consideration in fixing rates of wages, and rates paid in other industries constitute only one of these conditions, the Labor Board must be prepared to defend its action before the public if it fixes railway wages above market rates. We do not contend nor do we believe it economical that the railways should pay the lowest market rate at which they can secure men. Rather, they should pay those rates which will enable them to compete on an equality with other industries for efficient labor of the class required. This does not, however, necessitate the payment of the present wages, and the board can hardly do otherwise than to authorize large reductions in the present rates.

Is the Real Issue Labor Unionism Versus Efficiency?

THE SPOKESMEN of the labor unions before the Railroad Labor Board constantly repeat the charge that in seeking to set aside the national agreements, rules and working conditions established under government control the railways are trying to break down the labor organizations. They allege that the policy of the railways is part of a general movement initiated by Wall street financiers to establish the "open shop."

In this the leaders of the labor organizations are overplaying their hand. The railways have presented a large amount of evidence showing that the present agreements, rules and working conditions cause much inefficiency and large waste. They contend this is due to the facts, first, that no uniform rules and working conditions can be applied to the widely varying conditions of the entire country without producing inefficiency and waste, and, second, that the particular agreements, rules and working conditions now in effect are unreasonable in themselves.

The spokesmen of the labor unions have not presented a scintilla of evidence, or a single argument, either to show that these arrangements actually promote efficiency or that they do not promote inefficiency. If the contention of the railroads that they promote inefficiency is correct, and the implied contention of the labor leaders that their abolition would weaken the labor organizations also is correct, what conclusion must be drawn? Just one conclusion, namely, that maintenance of the present power of the labor organizations is incompatible with rules and working conditions which will promote efficiency.

If this is the position the labor leaders mean to take, some evidence which apparently supports it can be produced. As already has been shown in the *Railway Age,* there was no increase between 1917 and 1920 in the number of employees engaged in the actual operation of trains on the road. Meantime, there was an increase of 141,000, or 47 per cent, in the number of nine classes of employees in the shops. These facts are very significant in view of the further fact that no radical changes were made in rules and working conditions in road service, while a national agreement was made with the shop crafts. The huge increase in these classes of shop employees did increase the numerical power of the labor unions to which they belong. Rules and working conditions which increased efficiency in the shops would reduce the number of men it is necessary to employ in them. This undoubtedly would reduce the number of these classes of railway employees belonging to certain labor unions, and thus the numerical power of these unions would be reduced.

Is this what the leaders of the labor unions really have in mind when they say that the attempt of the railways to destroy the national agreements is an attempt to break the power of the labor unions? If so, then the leaders of the labor unions are raising a direct issue between labor unionism, on the one side, and railroad efficiency, on the other.

If this interpretation is correct, they are trying to maintain the numerical strength of their organizations regardless of the fact that this would mean perpetuating the employment of an excessive number of men, the maintenance of an excessive railroad pay roll and excessive operating expenses, and, in consequence, higher freight and passenger rates than would be necessary under reasonably efficient operation.

There are many people who claim that the increase of the labor unions in numbers and in power is absolutely incompatible with increases in the efficiency of production and reductions of the cost of production. They say that one of the fundamental principles of unionism is curtailment of the average output per man, upon the erroneous economic theory that the less each workman does the more men there will be employment for. They resist the growth of labor unionism because they believe the stronger the unions grow the more the cost of production will be increased, the less total production will become and the less of the necessaries and comforts of life there will be made available for the use and consumption of all classes of society, including the working class itself.

Are Frank P. Walsh, B. M. Jewell, and other spokesmen of the railroad labor organizations, who are appearing before the Railroad Labor Board, trying more or less unconsciously to prove the correctness of the views of those who oppose the growth of labor unionism upon the ground mentioned? If so, they are playing directly into the hands of the most uncompromising enemies of labor unionism. The public welfare demands steady and large increases in the total volume of things produced. Every student of economics, every man in public life who is entitled to be there, every intelligent man, knows this. Railroad transportation is one of the essential processes of production. Therefore the public welfare demands that railroad transportation shall be conducted as efficiently and economically as is consistent with railway employees being paid reasonable wages and not overworked. Every intelligent man knows this. Labor union leaders will, in the long run, bring disaster upon their own organizations and their members by making an issue between industrial and transportation efficiency, on the one side, and labor unionism on the other.

Labor leaders would, in the long run, promote the interests of their organizations and their followers by defending the rights of their followers and at the same time doing all they can to increase industrial and transportation efficiency. It is a notable fact, however, that while they have been charging that the railways and other employers are trying to break down the labor unions, they have not advanced a single rational and concrete suggestion for increasing transportation and industrial efficiency.

The Problem of the Sea Water Structure

THE PROGRESS of civilization is being constantly opposed by a multitude of animal and vegetable pests, many of which seem to thrive with increasing vigor under the new conditions set up by man as he changes his primitive surroundings to the highly developed agricultural or industrial community. Noxious weeds and destroying insects become more virulent as a new country is subjected to settlement. Likewise, marine borers have become an increasing menace. Thus, the reports of the many investigations which have been made to learn the truth about these pests are a unit in showing an increase in their inroads as the use of timber in marine harbors provides a greatly increased field for their operation.

The report on marine borers in San Francisco bay abstracted elsewhere in this issue is of interest to railway engineers as it throws further light on this problem. It presents a fund of information on the nature and functioning of these various organisms, the influence of salinity of the water as affected by the tides, floods, droughts, etc. However, the greatest emphasis is placed on the importance of a high degree of perfection in the treatment of timber that is to be submerged in sea water and of sanitation in keeping the harbor waters clear of all untreated timber which will serve to encourage the growth and spread of these troublesome pests.

As regards the efficacy of preservative processes for the protection of timbers placed in sea water, the present state of the art is in much the same position as that of concrete subjected to sea water. Examples can be cited of both eminent successes and hopeless failures in the use of both materials. Yet in most cases of failure of both concrete and treated timber, some defect in workmanship or material can usually be pointed out to which the failure may be ascribed with more or less accuracy. In the case of each it is clear that much more experimentation and study must be carried on before the full facts can be known. But in the meantime it will be necessary to build docks, trestles, piers, etc., with their supporting portions submerged in sea water, and the prospective builder is compelled to select the material of construction with the facts now at hand.

This determination must be made in each individual case on the basis of the local service records, taking into account the relative availability of the materials in the particular locality.

New Books

Fuel Oil In Industry. By Stephen O. Andros. 240 pages, 6 in. by 9in. Illustrated. Bound in cloth. Published by the Shaw Publishing Company, 910 South Michigan Boulevard, Chicago.

The use of fuel oils by the railroads is by no means new and the problems involved in its application to the locomotive have been carefully studied by railway engineers for many years; in fact, the value of this book to the railway mechanical or civil engineers might be questioned if it were not for the tremendous expansion in the use of fuel oil in all industries within recent years. Thus the increased price of bituminous coal has assisted in promoting the use of fuel oil both in maritime service and in many hundreds of stationary plants along the eastern seaboard. This in turn has introduced new problems relating to its transportation in bulk and storage in large quantities. Moreover, it must be admitted that refinements bearing upon the handling and burning of fuel oil are generally given more consideration in stationary and maritime service than in railroad use. For this reason, there is a field for a book of this character in railroad as well as industrial service which outlines, as it does, not only the principles of fuel oil combustion and the properties of fuel oils, but the methods of testing, storing and burning it together with a full description of its application to industrial and domestic furnaces. For instance, the book not only describes many of the details involved in the construction of steel storage tanks but refers to an interesting development in concrete oil storage tanks and describes at length all of the pipe setting and auxiliary machinery involved. While the book describes many types of burners that would not be applicable to locomotive service, still there are many points in connection with this subject as outlined in this book that will prove of particular interest to railway fuel engineers. The use of fuel oil in the manufacture of iron and steel and the heat treating furnaces is also described and illustrated in an interesting way.

Letters to the Editor

70-Ton Acid Tank Cars Built in 1912

CLEVELAND, Ohio.

TO THE EDITOR:

In the description of a sulphuric acid tank car of 70 tons capacity in your issue of January 14, the following paragraph appears:

"With the exception of two cars built for the General Chemical Company in 1916, the 50 cars on this order are, so far as known, the first 70-ton acid tank cars constructed."

It may be of interest to your readers to know that we owned and operated tank cars for the transportation of sulphuric acid with a marked capacity of 70 tons and with an actual carrying capacity of 75 tons of acid, as early as the year 1912.

The first car was put in operation in August, 1912; the second car in October, 1912. The next 13 cars of like capacity were added in 1915. In January of this year, we added 10 and we have at the present 15 more coming through the shops, all with a marked capacity of 70 tons, but with an actual carrying capacity in excess of this marked capacity.

JOHN HART,
Traffic Manager, The Grasselli Chemical Company.

The Importance of Supervision

TO THE EDITOR:

I have read with much interest the editorial in the issue of December 3, 1920, entitled "Will Railway Employees Help Reduce Operating Expenses?" I should like to answer this by stating most emphatically that they will not, unless they are properly supervised. The efficiency in railroad operation, or any other industry, depends entirely on the manner in which labor is directed. I make this positive statement basing it on the unalterable fact that the human race, taken as a whole, is inclined to be lazy, selfish and laden with a desire to govern, rather than submit to government. Not only this; the average man or woman is burdened with erroneous beliefs. This fact makes it an absolute necessity to have labor closely supervised and directed by the very highest quality of mind.

It has been the writer's experience that labor is just what is demanded of it; that is, if it is supervised and directed by one who is truthful, honest, upright, unselfish, energetic and, above all, not lacking in moral courage, there will be no lagging or lack in efficiency. Efficiency is needed more today than anything else, because the loss in this respect is costing the railroads of the United States at least a half-billion of dollars each year. For instance, take the loss in labor efficiency; the loss in material and supplies due to the spirit of "I don't care, it all belongs to a railroad corporation." To sum up this waste in dollars and cents would astound anyone except a deep thinker who has been in railroad work for a number of years.

Supposing the great army of railroad officers and employees, composed of about 2,000,000 of men and women, would get down to real work, a saving of at least ten cents per day each could be made, which would amount to $60,000,000 per year. Think of the vast number of non-producers now in controversy made up of representatives of labor, capital and the government, who are drawing large wages for engaging in battle royal for what each claims is just and right. The loss to the railroad stockholder, the labor organization and to the public, which is the government, is enormous and is beyond the conception of the average citizen.

The National Agreement, entered into by the government and the railroad employees during government control, has cost the railroads and the public millions of dollars for service that has never been performed. Parts of this agreement are the greatest pieces of error ever concocted. It is like a house built upon the sands; it has no solid base, and anything that is not based on principle cannot stand. The rules laid down in the National Agreement contain provisions that force the railroads to pay for service that is not performed. A rule that will force a government, a railroad, a private corporation or individual to pay for service that is not actually performed is not based on principle; its foundation is faulty and it cannot stand.

The abolition of piece-work was one of the greatest mistakes ever made because it is the only real protection that the railroads and the energetic man have against laziness, indifference, etc. The farmer, who is the base of our existence, the salesman, the engineer, the trainman, the coal miner all work on a piece-work basis; then why not the mechanical workmen on railroads? It is the only method that can be used to put "pep" in some men and keep up human interest.

The United States is today starving for industrial peace. The cry of "Peace, peace," when there is no peace, causes me to think that those who are responsible and who indirectly or directly supervise labor have not the moral courage to enforce the rule which is contained in the agreement between the railroads and organized labor. The National Agreement says that eight hours shall constitute a day's work, which I understand to mean that each man working under this agreement will work faithfully for eight hours, taking as much interest in the work as if the business wholly or partially belonged to him. Are the parties to this agreement doing this? I will let someone else answer this very important question.

During my many years of railroad service, having met and associated with many railroad officers and employees, I have met almost the universal thought, which to my mind is erroneous, "We must get along with the men; a railroad officer who cannot get along with the men will not last very long." This statement is correct. The officer who cannot get along with the employees will not last very long, but the real meaning is many times misconstrued by those who think that to follow the line of least resistance is the ideal way of getting along with the men; or, in other words, to permit some, or the whole to break the rules; to come and go and work when it pleases them. This is buying peace at a great price and it is a peace that is no peace.

In thinking of organization, I have often thought of the human body. What a wonderful organization it is! Governed by mind, the most powerful force known to the human race, the body and members thereof are directed by a mental force called desire. The railroad employees of this country are like one great human body; they will move quickly or slowly, efficiently or inefficiently; they will help reduce operating expenses or not, just in proportion to the quality of mind governing.

J. A. ALEXANDER.

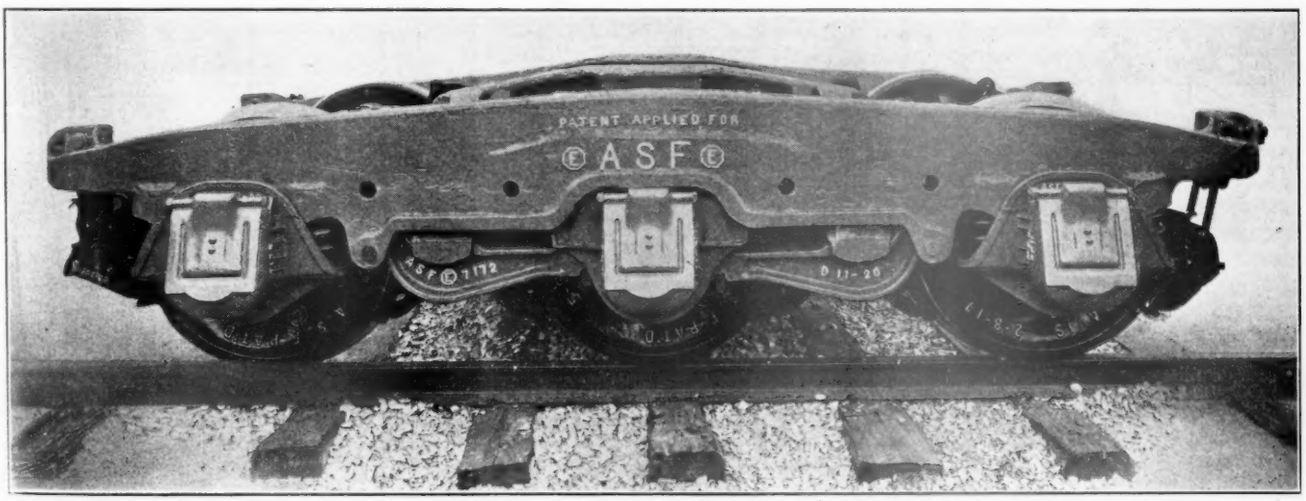
THE CANADIAN PACIFIC has taken a lease for 21 years of the first two floors and basement of a new 21-story building at Madison avenue and Forty-fourth street, New York City, and the building is to be known as the Canadian Pacific building. The passenger departments of both rail and shipping interests, lands, colonization, and development work will be brought together here, but the freight department will continue to have an office at the Woolworth building. Negotiations are under way with other transportation interests for space in the Canadian Pacific building.

Virginian Gondola Car of 120 Tons Capacity

Operating Economies Effected by Using 120-Ton Cars

Virginian Increases Gross Trainload from 7,950 to 13,200 Tons— First Application of New Six-Wheel Truck

THE VIRGINIAN RAILWAY has recently received from the Pressed Steel Car Company at Pittsburgh, 1,000 steel gondola coal cars of 120 tons capacity. This equipment is the heaviest in the history of transportation and is notable for two reasons: first, because it is the first instance where a large number of cars of such extremely high capacity have been placed in service, and, second, because the equipment has been developed especially to meet the operating conditions on the Virginian.

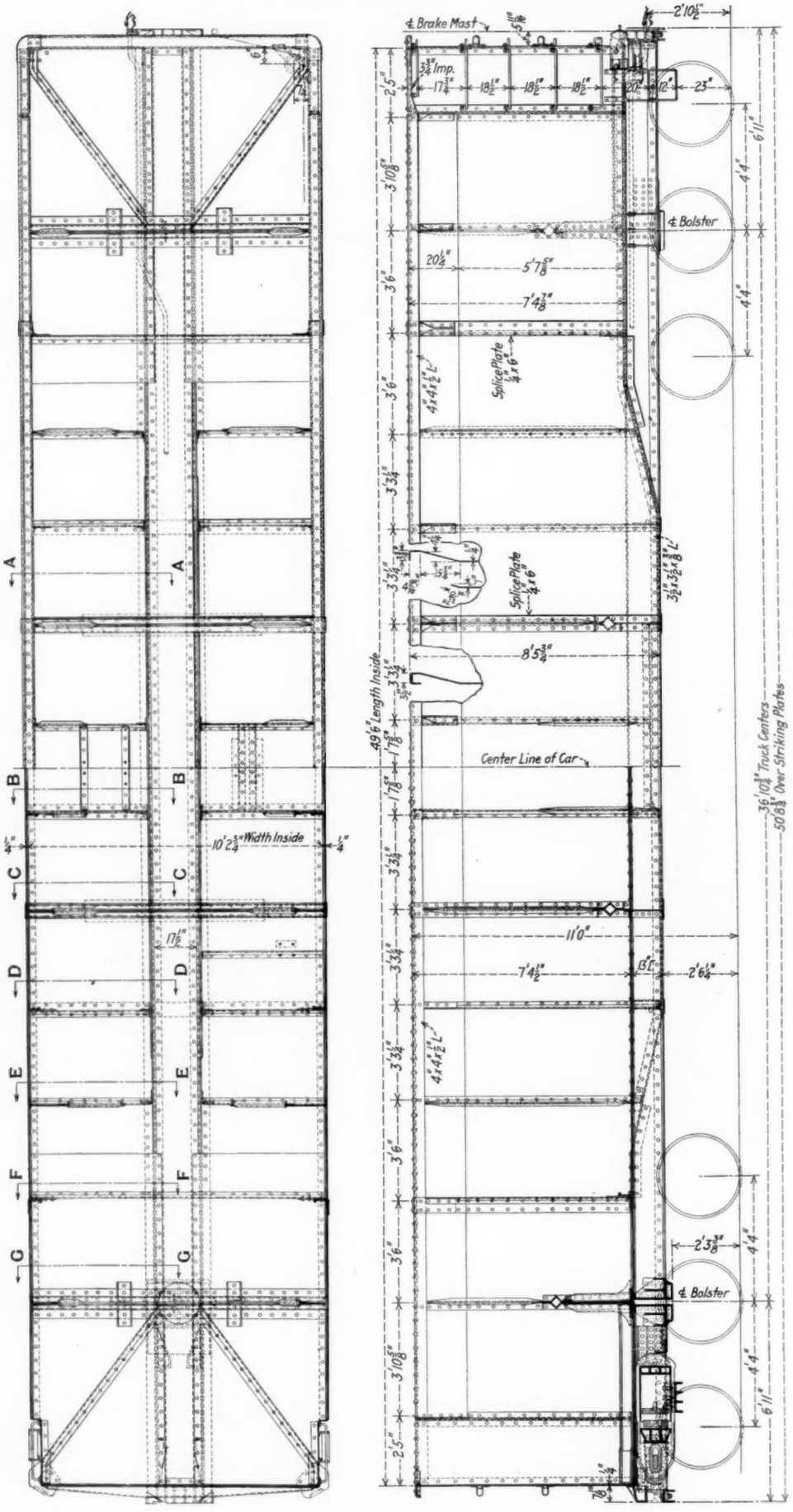


The First Application of the Lamont Truck Was Made on Ten of These Cars

Of the total traffic handled by the Virginian, 92 per cent is coal moving to tidewater and inland points from mines west of Princeton, West Virginia, the greater portion of which moves to Sewalls Point pier, 342 miles from Princeton. The profile consists principally of slight descending grades; thus the tonnage that can be handled in a single train is limited over a large part of the line, not by the tractive capacity of the locomotive, but by the difficulty of securing proper operation of the air brakes in the handling of long trains on descending grades to avoid break-in-twos.

Since such a large proportion of the traffic consists of tidewater coal, the normal operation of the road depends upon the ability to dump cars promptly on arrival at the pier. In order to secure the maximum capacity of the pier, duplicate unloading facilities have been provided. Two separate car dumpers, one handling a 55-ton car and the other, two 55-ton cars, or one 120-ton car, dump into electrically operated conveyor cars. The conveyor cars from one dumper are drawn by a cable hauling system up an incline to the top of the pier, from which point they are moved by electricity to the proper chute and the coal dumped through by air pressure. The other dumper is served by an elevator that lifts the car to a track running over the pier pockets.

Under normal conditions the Virginian moves a large proportion of its traffic in its own equipment, consisting principally of gondola and hopper cars of 55-tons capacity and, latterly, 120-tons capacity. Two of the former cars can be handled on the two-car dumper, or one 120-ton car, from which it will be noted that the adoption of a car carrying a heavier load will have the effect of increasing the capacity of the dumper and the efficiency of the pier. With this in



Plan and Side Elevation of the Body of the Virginian 120-Ton Car

mind, plans were made for the development of equipment having twice the gross weight of the 55-ton cars. In 1917 four sample 120-ton cars were placed in service to determine whether the use of such equipment would be practical and economical, and as a result of these experiments, the order for 1,000 cars of this capacity was placed in the spring of 1920, immediately after the roads were returned to private control.

The advantages of the 120-ton car under the conditions prevailing on the Virginian Railway can be judged by the comparison of this equipment with the 55-ton cars. The new cars with a capacity of 240,000 lb. weigh 78,900 lb., making the ratio of load to dead weight 75.3 per cent. The gondola and hopper cars with a capacity of 60 tons weigh 41,000 lb. and 44,000 lb. respectively, making the ratio 74.5 and 73.2 per cent.

The 120-ton cars are 49 ft. 6 in. long inside, while the 55-ton hopper cars are 32 ft. 6 in. long and the gondolas 40 ft. long. Thus the gross weight per foot of length for the 120-ton car is 61.7 per cent greater than for the 55-ton gondola, and 31.0 per cent greater than for the hopper. For a given length of train, the net tonnage that can be handled in the larger cars is even greater.

Interior of the Car Body, Showing Gusset Side Stakes, Bolsters and Cross Bearers

It has been found entirely practical to handle trains of 120-ton cars, but no extensive tests have been made so far because of adverse weather conditions. It has been demonstrated, however, by actual test that the gross load behind the tender in these trains averages 13,200 tons, compared with 7,950 tons hauled with the smaller equipment. It is the opinion of the operating officials that with favorable weather conditions, a train haul of 14,000 tons gross or 10,540 tons net load will be secured by the use of the 120-ton coal cars.

Construction of the Cars

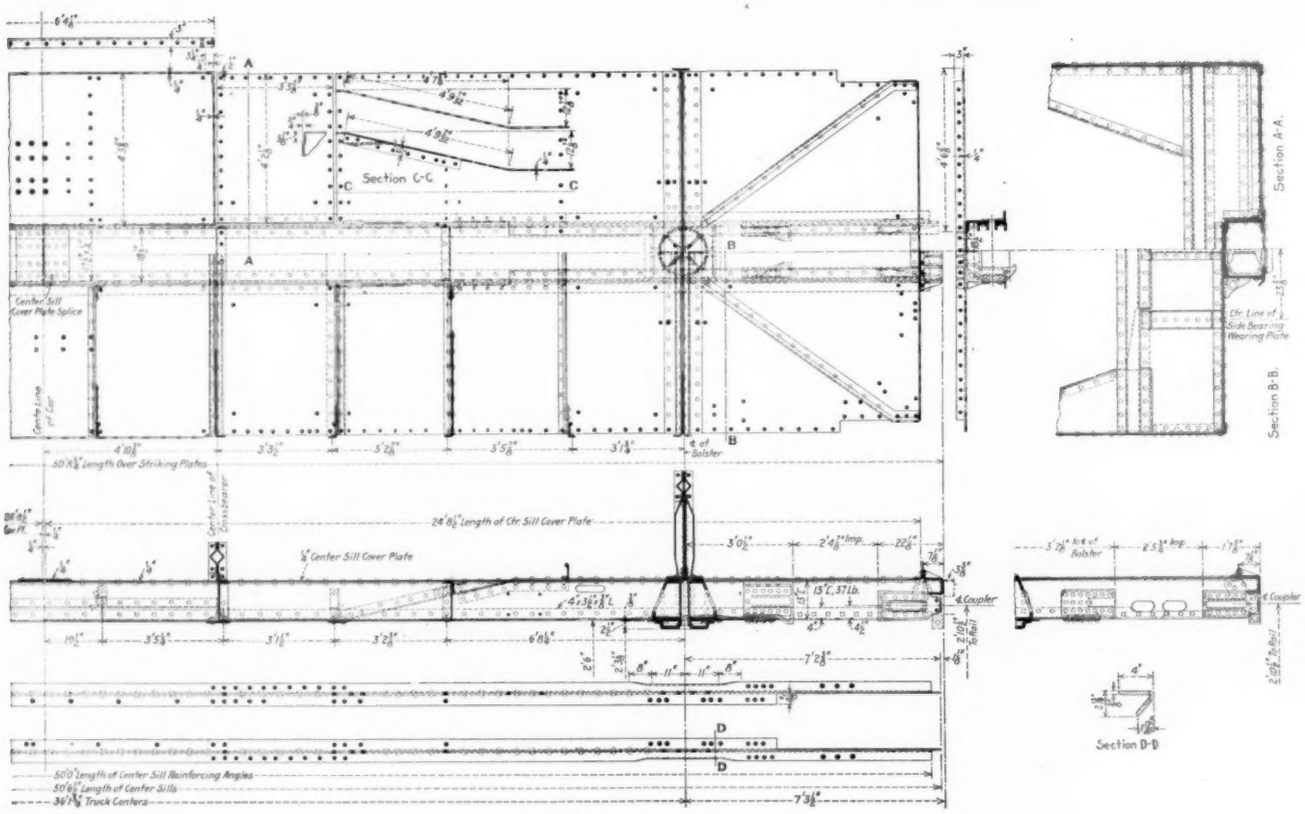
As already mentioned, these cars have been made extremely wide and high in order to keep down the length as much as possible. The car body is 49 ft. 6 in. long by 10 ft. 2¾ in. wide inside and has a depth at the center of 8 ft. 5⅛ in. and at the ends over trucks of 7 ft. 4¼ in. The cubical capacity is 3,850 cu. ft. level full or 4,450 cu. ft. with a 30 degree heap. This latter figure, with coal at 54 lb. per cu. ft., is equivalent to approximately 240,000 lb. The cars are stencilled 218,000 lb. capacity, but adding a 10 per cent overload brings the capacity to approximately 240,000 lb., the load which the car is designed to carry both from the standpoint of strength and as to dimensions.

The size of the car, coupled with the fact that it is deeper at the center than at the end, gives it the general appearance of one of the modern quadruple hopper cars. However, it is not a hopper car as it has no hoppers, drop doors or means of discharge other than from the top. It is to be operated solely on the lines of the Virginian and dumped only in car dumping machines. These facts suggested the design finally adopted.

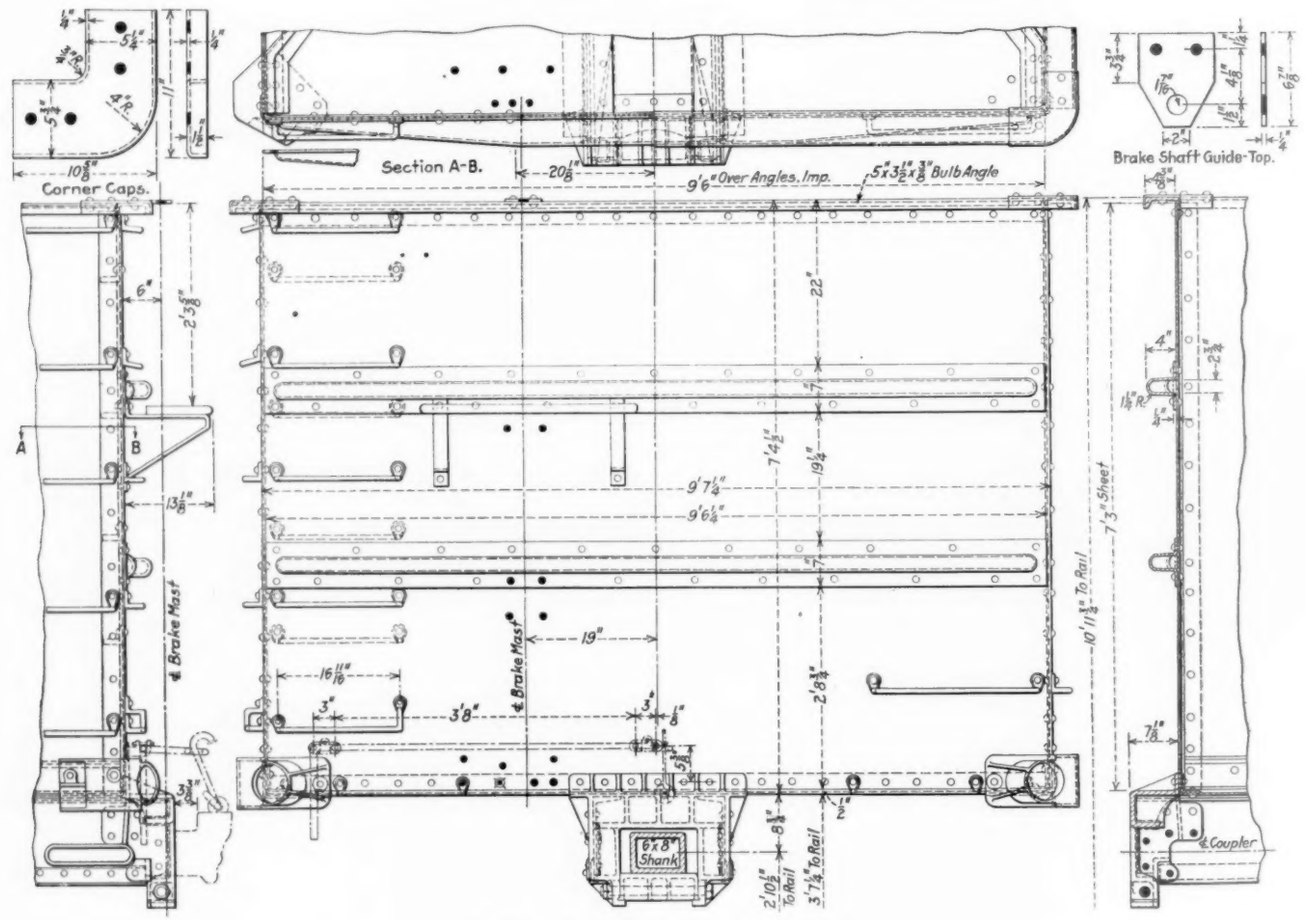
The sides, it will be noted, are entirely free from outside side stakes or other projections beyond the plane of the side sheets. The car presents a smooth, straight surface throughout the depth of the body at all points to engage the blocking and clamps in car dumpers, thus avoiding concentrated stresses on side stakes, top angles and other projections while the car is being dumped. This construction also admits of using practically all of the clearance width of the road for the inside or available loading width of the car and provides the required cubic capacity in a minimum length and height.

The sides are formed of ¼ in. plates sloped in near the top at an angle of approximately 15 degrees and then flanged out, overlapping the horizontal leg of the top angle to which they are riveted. The top angles are standard 4 in. by 4 in. by ½ in. rolled angles with the vertical flange outside in line with the plane of the side sheets. On the inside of the side construction 14 stakes are provided on each side and the connection between these stakes and the side top angle is effected through malleable iron castings, as is shown in the drawing of the car body. The side stakes consist of reinforced triangular gussets and 5 in. rolled bulb angles all directly connected to bolsters, cross bearers and floor supports, all of which are located inside of the car body. Along the bottom the sides are reinforced by 3½ in. by a 3½ in. by ⅜ in. rolled angle, which also supports the floor. This angle extends to within approximately 2 ft. 4 in. from either end. At these points the plane of the side sheets is dropped back into the car to bring the ladders inside the clearance limits and also to afford these a certain amount of protection in car dumpers and elsewhere. The assembled side construction forms an efficient girder which will carry the weight of the lading as well as the dead weight of the car at a low fiber stress and leave the center sills to take care of the buffing stresses.

The center sills are made up of two 13 in., 37 lb. standard rolled channels applied with the flanges toward each other and reinforced at the top by a cover plate and at the bottom by 4 in. by 3½ in. by ⅜ in. rolled angles. Five hundred cars are equipped with Westinghouse N-12-A draft gear and


Section C-C
Section A-A.
Section B-B.
Section D-D
Center Sill Cover Plate Splice
Center Line of Car
50'8¾" Length Over Striking Plates
24'0½" Length of Ctr. Sill Cover Plate
¾" Center Sill Cover Plate
Center Line of Crossbearer
Ctr. Line of Side Bearing Wearing Plate
℄ of Bolster
℄ Coupler
13'C. 37 lb.
50'0" Length of Center Sill Reinforcing Angles
50'6½" Length of Center Sills
36'1⅛" Truck Centers

Details of the Underframe

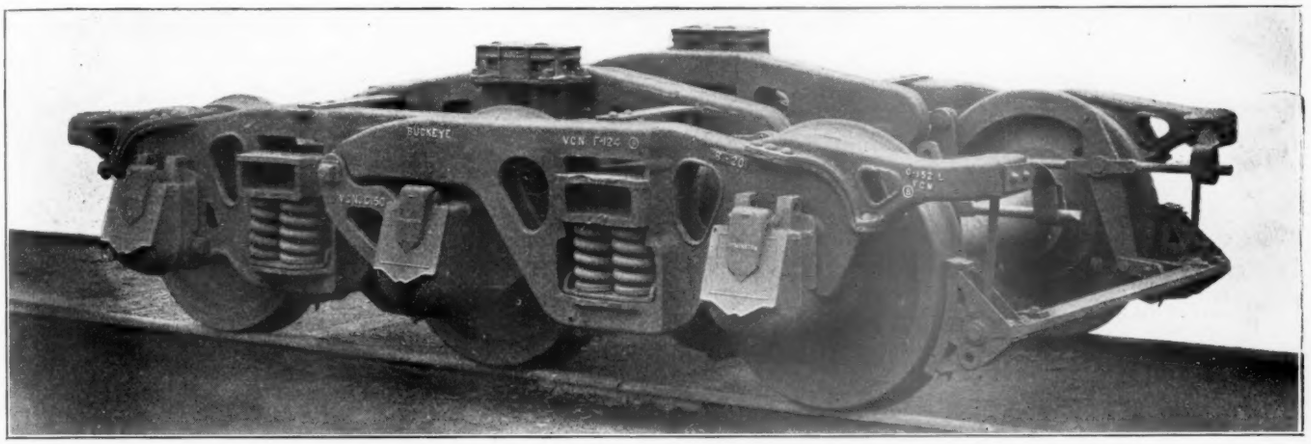


Details of the End of the Car Body

Lewis or Lamont trucks, being known as Class G-4 cars, while the remaining 500 cars have Cardwell duplex draft gear and Buckeye trucks. These are known as Class G-3 cars. On the Class G-4 cars the center sills are spaced 18½ in. apart and on the Class G-3, the standard 12⅞ in. spacing is employed. The center sills develop an effective buffing area of over 30 sq. in. and the ratio of stress to strain figured according to A. R. A. practice is below .05.

The ends are formed of ¼ in. plates reinforced at the top by a 5 in. by 3½ in. by ⅜ in. rolled bulb angle, intermediately by two pressed steel braces extending the full width of the car and at the bottom by the floor sheets which are flanged up to engage the ends and riveted thereto. The floor sheets are all ¼ in. plates and all floor supports, including bolsters and cross bearers, are of built up construction.

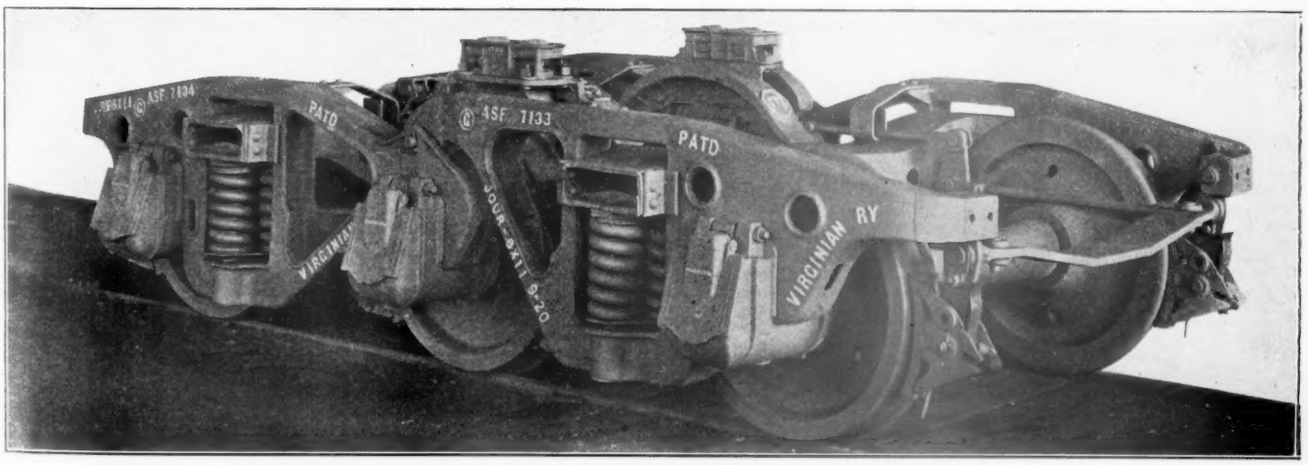
The trucks are of the six wheel type with cast steel frame, three designs being used as previously mentioned. They are equipped with A.R.A. standard 6 in. by 11 in. axles, 33 in. rolled steel wheels, Stucki side bearings and clasp brakes.



The Buckeye Six-Wheel Truck

middle of one of the cross bolsters, the ends of which in turn are carried on the longitudinal equalizers under the side frames. The principal feature of the equalizing system is the location of the springs at the journal boxes instead of over the equalizer. The journal boxes are of special construction in which seats are provided for coil springs on either side of each box, the truck frames resting directly on the springs of the end journal boxes. The springs at each of the middle journal boxes are spanned by a spring cap; on the middle of this cap bears an equalizer, from the ends of which are hung the inner ends of the main equalizers. The other ends of the latter are hung from the truck frames.

Westinghouse empty and load schedule KDE-4-10-16 brake equipment is used for the power brake and for braking the cars by hand a special screw type of hand brake is provided, as the ordinary type would not be suitable for spotting these cars on dumpers and in handling them about the mines where at points it is necessary to drop them down steep grades after loading. The couplers are of a special design

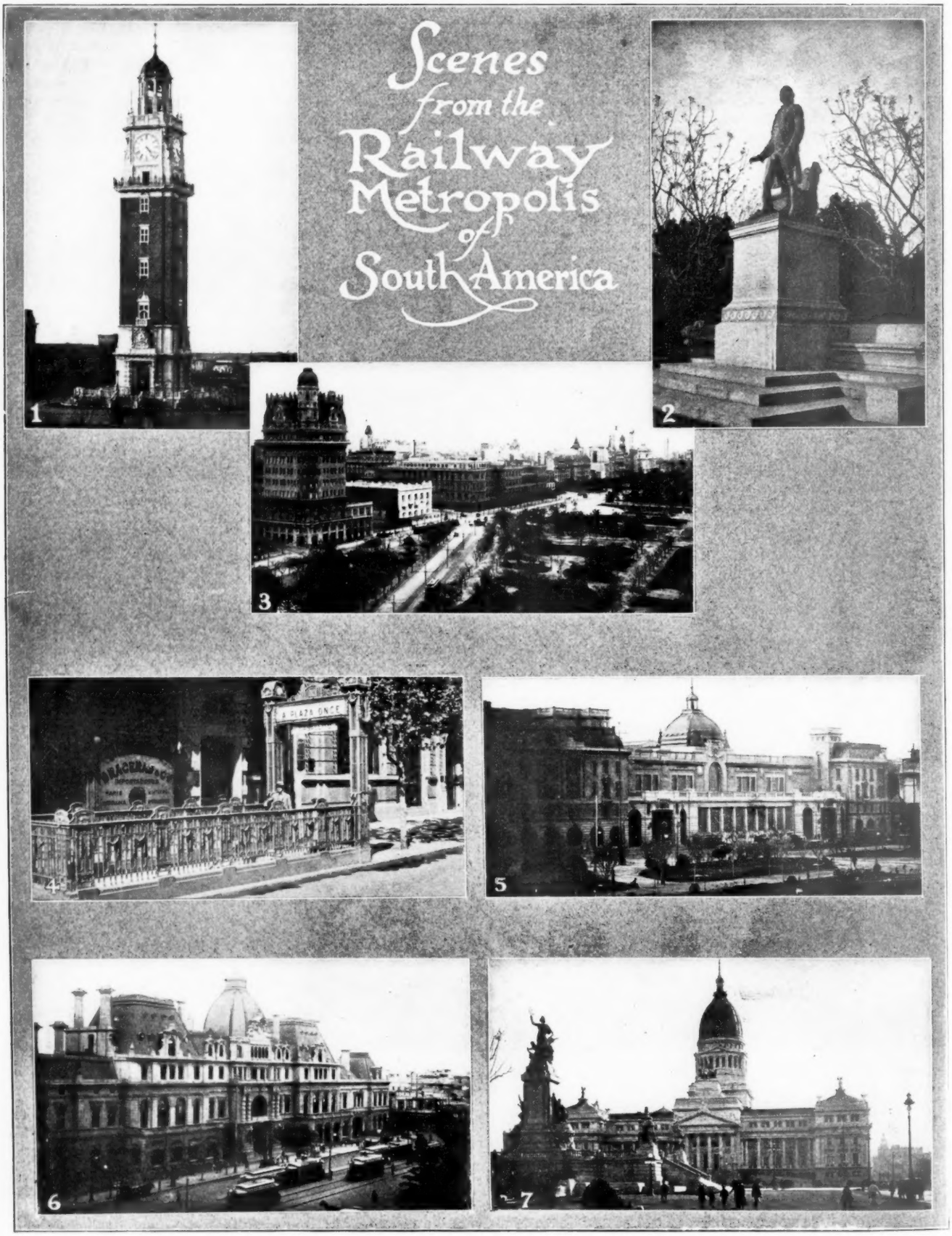


The Lewis Truck

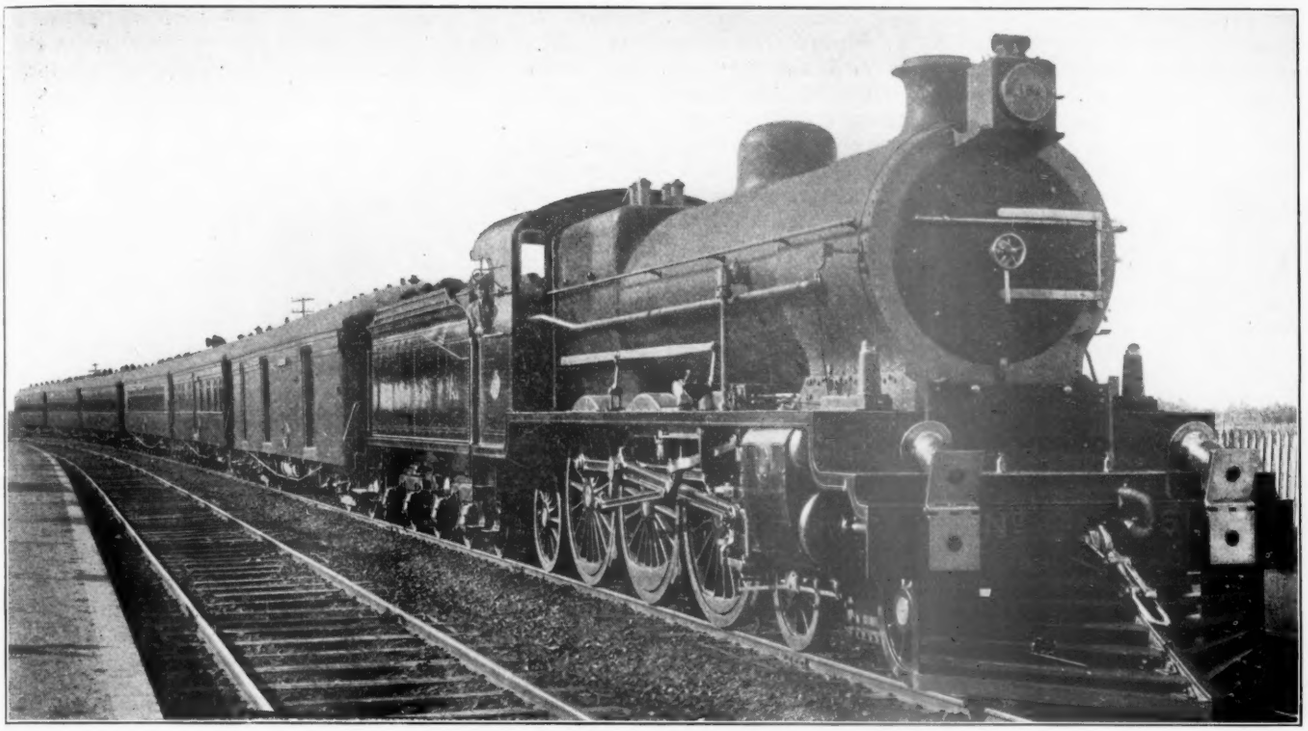
The first application of the Lamont six-wheel truck, which has just been developed by the American Steel Foundries, has been made under ten of these cars. The outstanding features of this truck are its short wheel base of 8 ft. 3 in., the arrangement of the springs and equalizing system, and the three piece bolster which uniformly distributes the load over the four points of support.

The bolster is made up of a central or equalizing member and two cross bolsters. The central bolster carries the center plate and side bearings and at either end rests on the having A.R.A. type D heads and slots for connecting to the draft gear with 2 in. by 6 in. forged keys and cast steel yokes.

The completed cars are 10 ft. 11¾ in. high from rail to top of sides. The Class G-3 cars weigh 78,800 lb. of which 41,600 lb. represents the weight of the body and 37,200 lb. the weight of the Buckeye trucks. The Class G-4 cars weigh 78,900 lb., the body weighing 43,200 lb. and the Lewis trucks 35,700 lb. These dead weights make the ratio of revenue earning load to total weight hauled 75.3 per cent.



1—British Monument in Park Facing Retiro Station. 2—Mon ument to George Washington in Palermo Park. 3—Colon Park, with Railway Building at Left. 4—A Typical Subway Entrance. 5—Retiro Station, Terminus of the Central Argentine. 5—Buenos Ayres' Great Southern Station. 7—The Capitol



"El Rapido"—the Buenos Ayres-Rosario Limited on the Central Argentine

British Railways Predominate in Argentina

Most of Argentina's Lines Are Ably Operated by Britons with British Methods and Equipment

By John P. Risque

Part I

ARGENTINA has approximately 20,370 miles of railways, most of which radiate fan-like from Buenos Ayres, and the American tourist who travels on almost any of them will find himself in the care of English railway men, for more than 75 per cent of the railways of Argentina are owned and operated by Britons.

On leaving Chile for the Argentine, Great Britain (in a railway sense) is entered immediately. The Transandine, which the traveler takes at Llai-Llai in Chile, is British throughout. At Mendoza, in the Argentine foothills of the Andes, the tourist leaves the Transandine after an interesting ride over the Andes and changes to the Buenos Ayres & Pacific, a 5 ft. 6 in. gage line, also of British ownership. The tiny Transandine train when it pulls up under the train shed at Mendoza at 7:45 p. m. alongside the waiting 20 car, double-headed Mendoza-Buenos Ayres express on the 5 ft. 6 in. gage track of the Buenos Ayres & Pacific, makes a comparison in which there is something of the ludicrous. It presents to the stranger, however, his first object lesson in gages, for varieties and extremes of which no other country excels the Argentine.

Anxious for a closer look at each car of the long train on which he expects to spend the night, the traveler will find three express cars, two baggage cars, three first-class day coaches, a dining car and 11 "dormitorios"—as the huge sleeping cars are called in that country—all resembling our own in design, with the exception of the "dormitorios," which contain private compartments of from two to four berths each, arranged crosswise of the car. The car roofs are arched, giving the train an appearance of uniformity in its entire length.

The cars are of wooden construction; four wheel trucks seem to be in general use; wheels are spoked and have steel tires on them—they are spelled "tyres" on the requisitions; vestibules as well as the doors seem unnecessarily narrow; couplers are of the screw and hook type, and the absence of foot plates exposes them to a considerable degree under the feet of the passenger who passes from one car to another. Large buffers, supported by springs, keep the cars apart and on the start of this exceptionally heavy train the passenger will unconsciously make a mental note that the start is easy compared to the start at home, where, under similar conditions, there would be a yank and thump of the drawbar that seems to indicate the withdrawal of one end of the car.

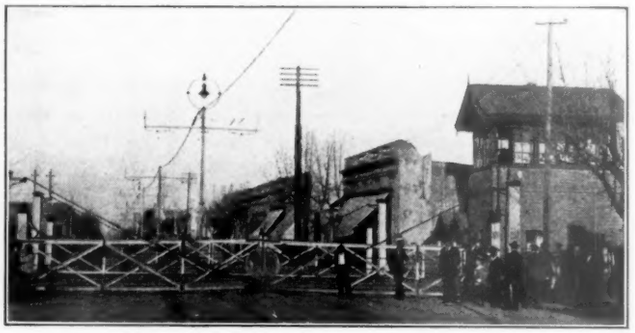
If the traveler had not noticed the drums under the cars as he peered under them in the dark for a look at the brake equipment, he would not be aware that the train was not being controlled by air brakes; the vacuum brake system seems to handle the train perfectly. The heavy train on its way from Mendoza in the Argentine foothills to Buenos Ayres, 24 hours away, has the slope in its favor. There is sufficient difference in elevations of the two terminals of this line to enable the double-header to attain a speed of 54 miles an hour. Stations all have an appearance of neatness; they

are well painted and clean, indicating constant attention. Crossing gates are numerous and quite elaborate. The names on the stations along the line are hard to pronounce, being Spanish, but trying it is good practice. If the traveler would get the full benefit of the ride, let him write down the names of the stations as he passes them. It is likely that following such names as Monte Redondo and Tamangueyu (or easier ones like Uribelarrea) there will occur such refreshing and familiar names as Newton, Monroe or Musters. Like the sprinkling of towns whose names end in "field" all over the United States, Argentina has some 50 "villas"—Villa Adelina, Villa Dolores, Villa Trinidad; the possibilities are enormous.

If the passenger has been careful enough to avoid missing any of the names, sooner or later he will write one down that will open a train of thought and conjecture as to its origin: "Open Door"—its significance is a mystery. From his observations of the English lines so far, he may as well decide that the name has nothing to do with the railway supply market on these roads, but though this door may be ajar, allowing an occasional order to sneak through to an American firm, it is not wide open enough to let through any volume of encouragement.

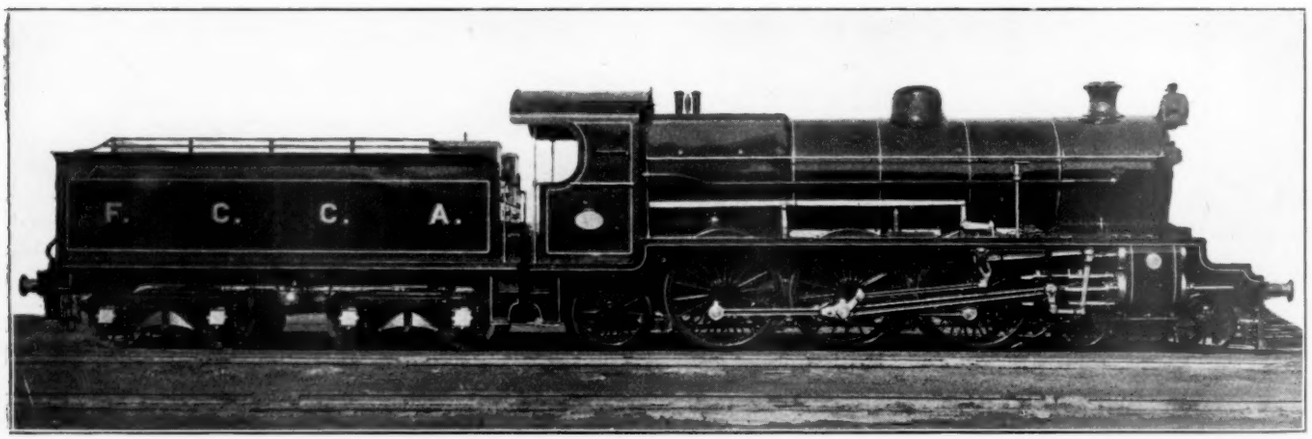
As he approaches Buenos Ayres if it were not for the distinctiveness of the architecture which proclaims the entrance to a foreign city, through miles of suburbs, the American could easily imagine himself entering the outskirts of a large city at home. The terminal of the Buenos Ayres & Pacific in Buenos Ayres is a wooden affair which it is expected to be replaced some day by a permanent structure. The arrival at this station places the interested railroader in a position to make some observations in regard to the arrangements of railway stations. Stepping out of the station in which he has just arrived, he sees the passenger station of the meter gage Central Cordova fronting on the same street; adjoining the latter is the beautiful $10,000,000 monument of the 5 ft. 6 in. gage Central Argentine Railway, "Retiro Station," the photograph of which is said to have been admired all over the world. As the spectacle of the three large railway stations, standing close together on the same street, gradually becomes more familiar, the question as to why they did not combine to build a common terminal, as in Washington or St. Louis, comes to the visitor's mind.

Having assimilated the situation sufficiently at these three stations, the tourist will find that further logical preparation for a trip out into the country is suggested by a visit to the other two large passenger terminals in the city—one, the Plaza Once station of the Great Western; the other, the station of the Buenos Ayres Great Southern at Plaza Constitucion. By the time the visitor gets through studying these stations he will commence to get an inkling of the size of the railroad layout that confronts him. If he has less than six months in which to make a study of these railways—and nothing has as yet been said of the Argentine government's system radiating from Santa Fe in the northern province of that name—it would be advisable to single out any one of the British broad gage railways and quote his observations from that line. To all intents and purposes, his story of this line will be, to those who are unfamiliar with the details of the railroads and the ways of the railroad men of that country, quite characteristic of all the other railway lines.



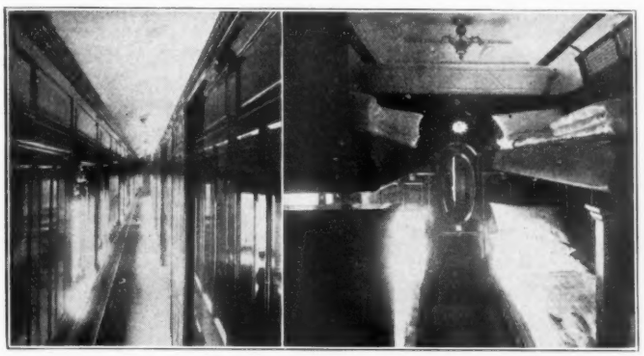
A Typical Crossing Gate in Argentina

The Retiro station is the starting point of a great 3,000 mile line. It has had lavished upon it an apparently unlimited amount of money and the brain work of engineers who seemed to have seen far ahead of the present requirements. Opened for business in August, 1915, the Retiro station's weekly record of trains in and out is 2,225, while the claim for the number of passengers handled yearly amounts to 24,000,000 incoming and outgoing. The principal dimensions of this terminal show that the total area occupied by the main building and train sheds is approximately 800,000 sq. ft. The frontage along Avenida Maipu and in line with the other two terminals previously referred to, is 525 ft. with a glass covered carriage entrance to the ticket office which measures 200 ft. in length by 60 ft. in width and the ceiling of which is 65 ft. 6 in. from the floor. Leading from the ticket office, there is a magnificent grand hall 480 ft. long by 82 ft. wide and with 62 ft. between the floor and the ceiling. The floors throughout are laid in mosaic patterns of tile and polished concrete and the lower 7 ft. of the walls in the ticket office and grand hall are tinted in olive green. Above this belt, the walls are finished in imitation stone and the ceilings are decorated with plaster of Paris mouldings.



The Prevailing Type of Power in Passenger Service on the Central Argentine

The dining hall measures 90 ft. by 40 ft. and has stairways leading to private dining rooms overhead, which have balconies looking out over the grand hall and the train gates which line the rear. There is also an additional dining room, called a first-class refreshment room, measuring 98 ft. by 60 ft. which corresponds to an American "lunch counter." Three of the eight train platforms measure 1,150 ft. in length; the remaining five are 820 ft. long, and all track-ends are equipped with hydraulic buffer stops. The station is complete with all facilities such as an information bureau, telegraph offices, parcel checking rooms, telephone booths, hair dressing parlors, retiring rooms and lavatories, barber



A Corridor and a Stateroom in a Central Argentine Sleeping Car or "Dormitorio"

shops, a post office and all of the miscellaneous adjuncts which contribute to the comfort of passengers.

From one end of the grand hall to the other, there is a display which is well worth the time of the railroader who would profit by the lesson of "the other man's ways." Of particular interest to the intending traveler in the country, will be found the entertaining arrangement of photographs, maps and clearly printed and understandable descriptions of points of interest out on the line, with time-tables, all of which are neatly framed and protected by glass on the "sandwich boards" distributed along the passageway. From four to six of these boards stand on either side of the ornamental, four-faced clock in front of the ticket office, with long double benches in between. Two or three of these same boards are located in front of the ticket office at the entrance; on every hand, the most interesting kind of advertising attracts the traveler. The advertisements of places are supplemented by large photographs of interiors and exteriors of the kinds of trains that will carry him. The lesson is so obvious that an American will perhaps wonder why his own lines do not try to a greater extent to capitalize in a similar manner the attractions of their own lines.

The second part of this article will appear in an early issue of the *Railway Age*.

Reduction in Western Live Stock Rates Asked

WASHINGTON, D. C.

A PETITION asking a general reduction in the advances in rates on live stock in the Western district allowed by the Interstate Commerce Commission in Ex Parte 74, and attacking the general policy of the rate-making provisions of the transportation act as applied by the Interstate Commerce Commission in that case, has been filed with the commission by S. H. Cowan, Clifford Thorne, Graddy Cary and S. C. Rowe on behalf of the National Live Stock Shippers' League, the American National Live Stock Association, the National Wool Growers, the Cattle Raisers' Association of Texas, the Corn Belt Meat Producers Association and the Kansas Live Stock Association. The petition particularly attacks the allowance of one-half of 1 per cent in addition to 5½ per cent as authorized by the law in the discretion of the commission. This, it is declared, is not a part of a lawful rate and is not for transportation service, but a tax against the shippers beyond the power of Congress or the commission. The amount allowed to the railroads of the Western district as a whole by reason of the addition of one-half of 1 per cent to the return proposed to be provided by the new rates, the petition says, amounts to $40,500,000 per annum. A reduction in the rates is asked by the amount of one-half of 1 per cent, which, it is declared, would effect a reduction of 30 per cent in the Western group and 20 per cent in the Mountain group of the advance allowed. It is also asked that a maximum advance in cents per 100 lb. shall be fixed by the commission. A large part of the petition is devoted to a showing as to the unfavorable condition of the live stock industry, which is said to be aggravated by the high rates.

It is alleged that the effect of the advance is to permit some railroads to earn in excess of 6 per cent on their value for the creation of a general railroad contingent fund and to provide for a reserve fund which is declared to be an unlawful, unjust and unreasonable basis of making rates, compelling the shippers to pay in addition to the reasonable rate for the service performed an unjust tax. The petition says the rates were made unreasonable by the percentage of advance and the complaint is directed to the advance rather than to the specific rates. It is stated that the petitioners will ask of the commission a special ruling allowing the case to proceed as against the principal Western systems and their subsidiaries for the purpose of determination of the issues in the case on the ground that the great bulk of the live stock traffic in the Western district is carried by the principal systems of railroads which will earn and do earn in excess of 6 per cent of their fair value.

It is asserted that no value of such systems was found by the commission nor was any basis named upon which the sum could be estimated. For this reason the position is taken that the shipper is deprived entirely of his right to reasonable rates "if this enormous advance is to be made to meet alone the requirement that the aggregate earnings of the Western district shall equal 6 per cent on an aggregate value of all lines at the excessive figures used in Ex Parte 74 as the basis of the calculation, without any basis of value of the system or systems of roads, which the shippers must use or quit business, as many will be compelled to do because of the conditions herein detailed, coupled with these exorbitant rates on live stock, feed and farm products." The petition asserts that in rendering its rate decision the commission was not acting in accordance with the provisions of the law, which required that rates shall be just and reasonable and that the requirements of the law as the commission construes it are impossible to carry out, "as has been proven by operation since August 26 because traffic is insufficient and the expenses of operation are too great."

The commission never having found what should be taken as the valuation of the properties separately, the petition asserts, there exists no basis for the advances of 25 and 35 per cent in the Western district, and it is also asserted that the valuation used by the commission for the district as a whole exceeds the value of the railroads by $25,000 a mile.

TRANSPORTATION COURSE AT COLUMBIA.—Government regulation and operation of railroads will be dealt with in a course on railway traffic management to be given by the Department of Extension Teaching, Columbia University, during the spring semester.

Freight Car Loading

WASHINGTON, D. C.

THE FREIGHT CAR LOADING, according to reports compiled by the Car Service Division of the American Railway Association, continued to decline during the week ending February 5. The total number of cars of revenue freight loaded was 696,997, as compared with 699,936 during the week before and 762,680 for the corresponding week of 1920, but it was greater than for 1919 or 1918, when the figures were 692,614 and 686,621, respectively. The coal movement loading shows a decrease of over 20,000 cars as compared with the previous week. The summary follows:

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

Summary—All Districts, Comparison of Totals This Year, Last Year, Two Years Ago, for Week Ending Saturday, February 5, 1921

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	Total revenue freight loaded: This year 1921	Total revenue freight loaded: Corresponding year 1920	Total revenue freight loaded: Corresponding year 1919	Received from connections: This year 1921	Received from connections: Corresponding year 1920	Received from connections: Corresponding year 1919
Eastern	1921	5,222	3,372	42,008	1,922	8,459	722	44,811	55,887	162,403	.....	.....	187,294	.....	.....
	1920	4,817	2,832	45,409	3,617	7,236	1,881	28,883	75,881	.....	170,556	167,852	.....	216,139	191,208
Allegheny	1921	2,207	3,131	48,388	6,103	3,645	2,823	35,015	43,883	145,195	.....	.....	98,241	.....	.....
	1920	2,628	3,121	41,814	3,894	3,932	2,125	34,565	55,796	.....	147,875	150,862	.....	108,214	129,482
Pocahontas	1921	161	123	14,769	159	1,504	56	2,712	5,005	24,492	.....	.....	13,287	.....	.....
	1920	173	120	19,211	685	1,754	270	130	9,067	.....	31,410	27,844	.....	18,119	20,123
Southern	1921	3,681	2,133	22,804	574	13,165	1,333	32,705	33,882	110,276	.....	.....	62,969	.....	.....
	1920	3,779	2,458	24,836	216	16,314	2,476	19,471	53,779	.....	123,329	106,039	.....	78,517	65,088
Northwestern	1921	10,900	9,136	6,022	1,256	17,703	1,219	23,584	26,530	96,350	.....	.....	44,044	.....	.....
	1920	9,825	8,448	14,225	1,196	19,459	1,784	18,929	38,694	.....	112,563	94,411	.....	60,139	45,587
Central Western	1921	10,125	11,494	16,980	303	3,019	1,967	27,583	29,766	101,237	.....	.....	43,258	.....	.....
	1920	9,450	10,385	23,535	392	4,576	2,780	21,681	41,836	.....	114,632	96,662	.....	67,028	56,087
Southwestern	1921	4,579	1,888	4,946	64	6,571	381	15,811	22,804	57,044	.....	.....	46,767	.....	.....
	1920	3,918	2,897	7,481	125	7,085	601	15,174	25,034	.....	62,315	48,944	.....	51,298	43,737
Total all roads	1921	36,875	31,277	155,917	10,381	54,066	8,501	182,221	217,759	696,997	.....	.....	495,860	.....	.....
	1920	34,593	30,261	176,511	10,125	60,356	11,917	138,833	300,084	.....	762,680	.....	.....	599,454	.....
	1919	30,654	29,948	149,868	.....	56,568	15,332	.....	410,244	.....	.....	692,614	.....	.....	551,312
Increase compared	1920	2,282	1,016	.....	256	.....	.....	43,388	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1920	.....	.....	20,594	.....	6,290	3,416	.....	82,325	65,683	.....	.....	103,594	.....	.....
Increase compared	1919	6,221	1,329	6,049	10,381	.....	.....	182,221	.....	4,383	.....	.....	.....	.....	.....
Decrease compared	1919	.....	.....	.....	.....	2,502	6,831	.....	192,485	.....	.....	.....	55,452	.....	.....

L. C. L. merchandise loading figures for 1921 and 1920 are not comparable, as some roads are not able to separate their L. C. L. freight and miscellaneous of 1920. Add merchandise and miscellaneous columns to get a fair comparison.

January 29	39,830	32,368	162,652	9,749	53,677	7,693	179,123	214,844	699,936	803,332	718,297	489,184	589,838	577,709
January 22	46,695	35,255	168,453	11,177	49,159	7,991	176,581	207,804	703,115	204,866	734,293	491,640	589,000	608,750
January 15	44,861	35,125	183,228	10,483	45,241	9,590	173,500	207,860	709,888	840,524	758,609	509,708	627,293	609,250
January 8	39,690	31,494	190,284	11,479	42,982	10,717	169,093	210,674	706,413	830,673	723,801	492,817	596,859	543,265

In a summary of general conditions as of February 14, the Car Service Division says:

Box Cars.—Requirements for box cars are being satisfactorily protected. Reports indicate improved demand for this equipment, surplus box cars for week ending January 31st showing a decrease for the first time since the surplus developed. Special attention should be given to the return of grain cars to their owners to avoid a shortage of cars in this service.

Auto Cars.—Cars should be disposed of in accordance with Car Service Rules. Where loaded with freight other than automobiles, care should be exercised to avoid commodities which leave a residue which will damage the finish of autos when later used in that service.

Stock Cars.—Practically all requirements being protected. Surplus cars should be disposed of according to Car Service Rules.

Refrigerator Cars.—There is an adequate refrigerator car supply in all sections. There is quite a fair movement of perishables from Florida and California, principally citrus fruits. Our information is that potatoes are still being quite generally held back in potato producing sections on account of unfavorable markets. Railroads are still permitted to load refrigerator cars with suitable non-perishable freight in the direction of the empty movement.

Open Top Cars.—A very decided improvement has been noted during the past few weeks in the movement of open top cars under the Car Service Rules. There exists on the part of most of the railroads a disposition to interpret and apply the rules liberally and this has resulted in minimizing to a large extent such temporary difficulties as have been reported. The lessening demand for open cars is one of the prime factors in stimulating the return of such equipment to the home roads, and an unusually large percentage of this equipment is returning home in bad order. This should be a period of rehabilitation; a definite car repairing program at this time is most necessary if the heavy transportation demands of the near future are to be satisfactorily met.

Flat Cars.—Requirements have practically been protected. Surplus cars should be sent to owning lines in accordance with Car Service Rules.

During the period since the car shortage has given way to a large car surplus there has been more or less friction between railroads as to the disposition of empty cars and almost as great a scramble to avoid the necessity for paying per diem on idle cars as there was formerly to obtain possession of cars which could be loaded. To meet this condition, the Car Service Division has announced in a bulletin to all railroads that reciprocal arrangements are being made between certain railroads for the storage of surplus cars where the equipment is not needed by the owner and where facilities permit holding the cars, per diem being waived while cars are held out of service.

Empty Car Mileage

By this arrangement there is saved the expense of empty mileage for the return of cars to owners, with the prospect that loading may develop for the cars a little later to or in the direction of the home road.

"In view of the fact that many roads have now on their rails ample number of home cars for local needs and to fully supply the repair forces," the circular says, "it is our recommendation that consideration be given to making arrangements of this kind wherever the conditions justify. A plan of this kind does not conflict with car service or per diem rules, and where it results in the mutual reduction of transportation expense it would certainly seem highly desirable under present conditions to encourage the practice."

The number of surplus freight cars continues to increase. For the week ending February 8 the average was 358,065 as compared with 324,186 the previous week.

The percentage of home cars on home lines on February 1 had reached 58.9. On March 1, 1920, when the roads were returned by the government, 21.9 per cent were at home.

Employees Seek to End National Agreements Case

B. M. Jewell Asks Labor Board to Refer Dispute Over Working Rules to Joint Conference

B. M. JEWELL, appearing before the Railroad Labor Board at Chicago on February 17 in the resumption of hearings in the controversy over National Agreements, asked that the Board take the following steps immediately:

"First: That the Board refer the National Agreements which are now before it to a joint conference of the representatives of the railroads and of the labor organization with the recommendation that their disagreements be adjusted by negotiation as soon as possible—the Board agreeing to pass immediately upon any points of difference which may arise from the negotiations.

"Second: That the Board request the representatives of the railroads and representatives of the labor organizations to meet the Board in conference to consider the establishment of boards of adjustment as contemplated by the Transportation Act.

"Third: That in reply to Mr. Atterbury's notice to the board and his subsequent letter to the chairman advising him that he contemplates filing a flood of individual complaints to reduce the wages of unskilled employees, the Board recommend to Mr. Atterbury that he meet in general conference with the representatives of the employees affected so that the existing General Agreements will not be impaired and the matter brought to the board in the form of a single complaint."

Mr. Jewell declared his constructive proposals were brought forward with the following objects in view:

"1. To insist upon the fundamental principle of collective bargaining which is now the real issue before the Board in our pending cases.

"2. To expedite the cases which otherwise will absorb a vast amount of time and effort.

"3. And to restrain Mr. Atterbury and the railroads from preventing the proper functioning and destroying the effectiveness of this Board by flooding it with a large number of individual complaints which it cannot handle."

Mr. Jewell also asked that a conference be called immediately between the railroad labor chiefs in Chicago and the members of the Association of Railway Executives who are meeting in Chicago on February 18.

"We do not wish to perpetuate any unreasonable rules or working conditions," Mr. Jewell asserted. "We do not wish to cause the railroads unreasonable expense. We shall not now advocate—and never have supported—any rules that do this."

"In closing, I wish to emphasize the fact that we are not asking you to render a decision. Neither are we requesting that you secure the consent of the railroads to the procedure we suggest. It is clearly within the province of the Board to make a recommendation even on its own motion. We are asking you to make these recommendations because of the fundamental principles involved in the pending cases to which the question of the propriety or reasonableness of certain rules is secondary, and in order that the work of the Board may be accelerated and the status and functions of the Board conserved."

Mr. Jewell presented as an alternative the necessity for postponing the case until March 14 to allow time for the preparation of a reply to the carriers' presentation.

Atlanta, Birmingham & Atlantic Case Continues

The efforts of the Atlanta, Birmingham & Atlantic to secure authority to reduce the wages of its employees below the rates set by the Board's decision of last July have attracted much attention, the case coming before the Board simultaneously with the introduction of General Atterbury's evidence in the National Agreements hearings outlining the precarious financial condition of many of the carriers. The case is also viewed with interest inasmuch as the rulings of the Board in this case will undoubtedly establish precedents which will serve to guide the Board, the carriers and the labor organizations in preparing, submitting and arguing future cases of this character. It is not, however, considered in the light of a test case by railway executives.

The opening of the case was described in the *Railway Age* of February 4, (page 319). The carrier had ordered a cut in the wages of its employees effective on February 1 because of its inability to meet its operating expenses. Despite drastic reductions in working forces and in train service the carrier was losing about $100,000 a month. The employees objected to the wage cut and, when conferences were held between their representatives and representatives of the carrier, a controversy arose as to whether the wage reduction could be made effective, under the terms of the Transportation Act, pending a decision by the Labor Board. The representatives of the carrier held that the wage cut was unavoidable and would have to be made on the date announced even though the Board had not reached a decision on the employees' appeal. The employees held that the existing rates of pay should be continued until the Board had made its ruling.

When the case came before the Labor Board on January 25, the employees refused to present evidence in the case until the Board had instructed the carrier to rescind its wage cut order. The representatives of the carrier after presenting voluminous evidence showing the financial condition of the road, held that they had not violated the spirit or letter of the Transportation Act in cutting their wages first and then coming before the Board. Subsequently the Board passed a resolution upholding the employees' contention and ordering the carrier to rescind its wage cut order. This resolution was reproduced in full in the *Railway Age* of February 4, (page 319).

Hearings in the Atlanta, Birmingham & Atlantic case were completed on February 15, both sides closing their presentations. The Board then took the case under advisement.

Another case similar in many respects to that of the Atlanta, Birmingham & Atlantic was also brought before the Board on February 15. The Missouri & North Arkansas, through an order issued by the receiver of the road, C. A. Phelan, reduced the wages of its employees on February 1. The employees protested to the Board and as a result the case was docketed. In the meantime the employees of the road walked out and their places have been filled with "imported labor."

Mr. Phelan in making his presentation on behalf of the carrier took the position that the carrier is not legally before the Board because, not being a party to the controversy which ended with the Board's decision number 2, it has never been heard on the subject of wages and has not therefore violated the Board's award in reducing the wages of its employees. The rates of pay fixed by decision number 2 had been applied on the Missouri & North Arkansas only on the condition that the road could earn enough to pay them. M. C. Carry and Charles MacGowan, appearing in the case on behalf of employees, asked the Board to refuse to hear the case because the company had violated the Board's ruling by

putting into effect a wage cut without authority from the Board.

The urgency of the Atlanta, Birmingham & Atlantic and the Missouri & North Arkansas cases has caused the Board to hold extra sessions during the vacation from consideration of the National Agreements case. The evidence of the employees and representatives of these two roads being completed, February 17 was set as the date upon which hearings in the controversy over the National Agreements would be resumed.

W. S. Carter Presents Employees' Case

The case was reopened on February 10 when E. P. Curtis, vice-president of the Order of Railway Conductors, and W. S. Carter, president of the Brotherhood of Locomotive Firemen, presented the employees' side of the controversy. Mr. Carter attacked as irrelevant the carrier's contention of inability to pay the existing rates as justification for the wage cut. The financial condition of the road was a subject for the consideration of the Interstate Commerce Commission and not the Labor Board, according to Mr. Carter. In discussing this phase of the controversy, Mr. Carter stated that the application of the consolidation provisions of the Transportation Act would eliminate the financial difficulties of the carrier and that in his opinion the Atlanta, Birmingham & Atlantic would be consolidated with the Louisville & Nashville.

B. L. Bugg, president of the Atlanta, Birmingham & Atlantic, replied to Mr. Carter's statements by reiterating that the financial and operating statistics and evidence presented to the Board at the session on January 25 dealt only with the road's inability to pay the wages fixed by the Railroad Labor Board.

The hearings in this case were continued in the evening of the same day, and Chairman Barton, in opening the extra session, pointed out to both the carrier and its employees that the Transportation Act empowers the Board to fix just and reasonable wages upon seven considerations and suggested that the additional evidence presented to the Board in this case deal, as far as possible, with these seven considerations. The representatives of the carrier reiterated their position, i. e., that the road cannot continue to operate unless its payroll is reduced.

The hearings were continued on February 14, when Mr. Bugg, acting in accordance with Chairman Barton's suggestion presented a large amount of data regarding the decline in the cost of living in the territory served by his line and the wages paid for similar work in outside industries. This data showed that, whereas the road is asking for reductions of from 20 to 25 per cent in its wage rates, the cost of living has decreased about 33 per cent. Similarly the wages paid in outside industries have decreased from 25 to 50 per cent while the road's wage scales have remained unchanged. Representatives of the employees protested the introduction of this new evidence without avail, inasmuch as Chairman Barton had specifically requested the presentation of such evidence.

Board Halts Erie Wage Cut

Following the precedent established in the Atlanta, Birmingham & Atlantic case the Board issued an order on February 14 directing the Erie to rescind its recent order reducing track laborers' wages, re-establishing the seven day week for train despatchers and deducting the January 31 earnings of telegraphers. The order was to have been effective on February 1. The United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers and the American Train Despatchers Association filed a complaint with the Board, and the following resolution was passed by the Board as a result:

I

Resolved, in case of disputes which have arisen between the Erie Railroad and its employees by reason of the said railroad having reduced the wages of track men to 30 cents per hour, effective February 1, and having ordered that train despatchers work 7 days per week without relief and having ordered the deduction of January 31 earnings of telegraphers whether they work or not on that day, that objection having been made by the United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers and by the American Train Despatchers' Association and a dispute having arisen in regard to the proposed reduction and deduction and the matter having been brought before this Board, the Board decides that no change of any kind in the rates of pay or in the rules and working conditions shall be made, except by agreement between the parties, until the disputes are heard and opportunity given for this Board to decide. The Board will proceed with the further hearing and consideration of these disputes and sets February 23, 1921, as the date of such presentation of evidence and arguments as the parties may desire to offer.

The Board suggests further conference between the parties and an effort on their part to agree upon a settlement.

II

Whereas, this Board having reason to believe that Decision No. 2 of this Board has been violated by the Erie Railroad in that the said carrier on or about January 31, 1921, directed the reduction of wages of the trackmen, employees of the said carrier, to 30 cents per hour, contrary to Article III, Section 6, of Decision No. 2 of this Board, and also having directed the deduction of January 31 earnings from the January earnings of all monthly rated employees and of all daily rated employees classified as monthly rated employees prior to Decision No. 2 of this Board.

Resolved, that pursuant to Section 313, Transportation Act, 1920, notice be given to the chief executives of the Erie Railroad and to the organizations of employees directly interested in such orders of the said carrier of a hearing to determine whether in the opinion of the Board a violation of the decision of this Board has occurred.

The Board sets February 23, 1921, as the day of the hearing.

Board Decides Norfolk & Western Dispute

The dispute between the Norfolk & Western and its conductors and trainmen, reported in the *Railway Age* of January 7, (page 126) and of January 14, (page 202), was ended by the Board in a decision dated January 29 and announced on February 14. There were 25 points in controversy in this case, 13 of which were decided by the Board in favor of the carrier and 10 of which were dismissed either because of lack of jurisdiction or improper presentation. But one point was decided in favor of the employees and one point was dismissed with recommendations for further negotiation.

The Board held that the railway was within its rights and complied with the provisions of Supplement 25 to General Order No. 27, in changing the home terminal from Columbus, Ohio, to Portsmouth. The employees objected to this on the ground that it was arbitrary and designed to inconvenience them. The railroad was sustained also in the employees' request for reclassification of service, which, if granted, would have the effect of increasing the present rates of pay for "shifter" and "mine run" service. On the subject of yardmen's seniority, in which the union leaders asked for a new rule that "when a foreman forfeits seniority as such as provided in Section (e) he may displace any junior helper," the Board denied the request, with the explanation that the existing rule and practice is just and reasonable. Discrimination between white and black workers was not recognized by the Board, which denied the employees' request for a new rule as follows:

"Any vacancies occurring in the ranks of yardmen will be filled with promotable men. This in no way to interfere with the rights of yardmen in the service of the company. The or-

ganizations represented in this agreement will be insured not less than 85 per cent of the men employed in the yard, and will be given preference in the employment of yardmen available."

Testimony during the hearing of the case showed that "promotable men" meant white men, since no white man could be expected to give place to a negro superior, and that the request for 85 per cent Brotherhood of Railroad Trainmen in the yards' employees was to exclude many negroes from the yards, since they are not eligible for union membership.

Among the other points in the controversy decided in favor of the carrier are the following:

Controversy over rates of pay in branch line service, i. e., the proper application of the provisions of Supplement 16 to General Order 27 of the Railroad Administration.

The request for a new rule in the trainmen's schedule regarding the "duration of agreement."

The request for a new rule stating that yardmen riding cars on hump yards will not be required to control more than one car unless they are coupled.

The request for a new rule giving preference in filling switchtenders' positions to former yardmen and trainmen.

The request that yardmen handling work or wreck trains in yard limits be paid yard rates instead of road rates.

The request that a self-propelled clam shell used on main track by masonry forces be classed as a work train.

The employees' request for a rate to be incorporated in the trainmen's schedule for baggagemen handling express was decided in favor of the employees.

Some Suggestions on Office Correspondence Filing

General, Unit and Sub-Files and File Book for Cross Reference Facilitate Locating Letters

By Grant Gibson

Is your correspondence file a real file system or a fill system? When you need a particular file, can you put your hands on it immediately or do you "dig," and if so, how much time do you lose in "digging?" When you call for a file, does your file clerk bring you the entire subject file or the individual piece you need?

One railway officer termed his correspondence file "a barrel system" and by way of explanation added that from the difficulty he had in getting the proper file quickly, he assumed all the correspondence was thrown into a barrel and his file clerk had to burrow into it every time a file was called for.

The file is the heart of office organization, and with a weak heart the office cannot function properly.

The system described in the following was put into effect in a master mechanic's office; it has since become a standard in all mechanical department offices on the road, including that of the superintendent of motive power, and doubtless the ideas presented would prove of value in other departments.

In addition to absolutely solving filing difficulties, this standardization has many virtues. It permits of transfer of file clerks from one shop to another, makes it much easier in the event of a transfer of chief clerks, and last but not least, makes for economy in stationery and printing. The file book is standard and the file boxes are standard. For permanent storage of old files, a cheap, heavy, telescopic cardboard box is used.

The Unit System

A unit file system does away entirely with "generalities," as it gives to each batch of correspondence an individual number as a suffix in addition to the general file number.

As example, refer to sketches given in Figs. 2, 3 and 4. The subject file in Fig. 2 is "Engine Failures." It is given general file number 1 and the first engine failure is given suffix number 1, making this unit File 1-1; the second failure is given suffix number 2, or File 1-2, etc.

"Accidents to Trains" is the subject in Fig. 2 and this is given general file number 2.

Each subject has a general or prefix number and each case coming up under the subject is given an individual number.

Recording of Files, Incoming Mail

To be a first-class file clerk, a man must have a good memory. On the other hand, a first-class file system is one that does not tax the clerk's memory. Therefore a "fool proof" system necessarily requires written records.

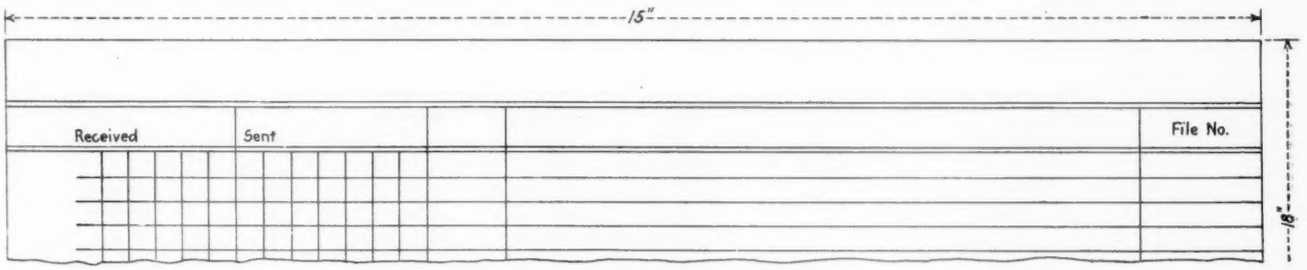


Fig. 1

The mail should be opened by the file clerk, stamped with a dating stamp and immediately entered. The clerk quickly becomes familiar with his general numbers and where the correspondence is voluminous, he usually first marks his general file number on all the mail (using a colored pencil) and next sorts numerically, in sequence, by this number. He is now ready for entries.

The index tags, as shown in Fig. 5, show the file number and subject. Having already marked his general file number, the clerk quickly turns to the corresponding number on the tag. The clerk enters the date of the letter and, by abbreviation or initial, from whom received is noted in one of the squares allotted for this under the caption "received" at the left hand side of the file page.

He uses the wider space to the right of the "sent" space

for miscellaneous information such as car number, locomotive number, date, location, division, etc. This gives the advantage of quick location of specific cases. Figs. 2, 3 and 4 give examples of this. The large space on the right of the sheet allows an opportunity to give brief information as to the sense of the letter. On the right is the general file number and the unit number, which unit is marked on the correspondence in the ordinary way.

The numbers applied are the permanent identification mark for this piece of mail and any subsequent letters sent out are marked with this same number, in addition to which a small rubber stamp is used which reads "In answering this letter, kindly refer to file number ....." Before long the majority of letters on old subjects which come in have a file reference which simplifies the clerk's work.

While the clerk is entering, he sorts the mail in two baskets, one for the new cases just coming in, and the other for "look ups"; that is, referring to a case on which there are some previous papers. When all the letters are entered he takes his "look ups," secures his papers from the files, attaches them to the new letter, places these cases with those of new cases and places the entire lot on the chief clerk's desk for perusal, disposition, etc.

This, at first hand, may appeal to the reader as a slow process, but in the office of the superintendent of motive power on one of the largest mid-west railroads it consumes only from one and one-half hours to two hours each morning, so by 10:00 a. m. the chief clerk has the day's mail before him, and he rarely finds it necessary to go back at the file clerk for additional papers.

Train Delay and Engine Failures – Division No. 1.

Received	Sent	Eng. No.	Date	Location	Cause	File No. 1
11-25 GM; 11-30 MM	11-27 MM; 12-3 GM	200	11/23/20	Marion O.	Bursted Flue	1A-1
11-27 GM; 12-1 MM	11-29 MM	300	11/25/20	Dayton O.	Hot Driving Box	1A-2
12-3 GM		400	12/1/20	Cincinnatti O.	Hot Trailer-Box	1A-3

Fig. 2

File 1-1: A letter from the general manager dated November 25 was received, pertaining to the failure of engine 200 at Marion, Ohio, on November 23, on account of a bursted flue. A letter was sent to the master mechanic on November 27, that he replied on December 1 and the case was closed out to the general manager on December 3.

File 1-2: Received letter from general manager November 27, wrote master mechanic November 29, received reply December 1, but case not closed out to general manager as no entry is made under "Sent" for general manager. Thus almost at a glance the file clerk can tell just how the case stands.

Filing

Two sets of file boxes are used, one for closed files and one for open files, or files on which an answer is expected. The closed file simply consists of one file box for each general file number and the units are filed numerically therein, the lowest number being on the bottom, this to permit of ready access to papers as one usually refers to the latest cases.

The outside of the file box contains a small receptacle in which a card is placed. The card identifies the box thus:

File No. 1
From No. 1 to

As the box is filled, the number of the last unit is written on the card and the box is ready for storage. The open file can usually be handled in one box. This is handled numerically also, filing, first by general file number, then by unit number. The advantage of the open file is to permit of tracing for answers and for a ready reference when matching up incoming mail. The open files are usually kept on the file clerk's desk.

Accidents to Trains – Division 6.

Received	Sent	Eng. No.	Train No.	Date	Location	Cause	File No. 2
11-22 S; 11-28 MM	11-25 MM; 11-29 S	1001	102	11/19/20	Sandusky	Eng. Derailed - Broken Track	2-1
11-23 S; 11-26 MM	11-26 MM	4002	105	11/21/20	Cleveland	C.B.&Q. 150123 - Derailed - Broken Flange	2-2
12-1 S		1002 1139	56 57	11/29/20	Dayton	Collision	2-3

Fig. 3

Outgoing Mail

The outgoing mail is sent out three times a day: namely, 11:30 a. m., 3:00 and 5:00 p. m. This mail is collected by the office boy, who encloses the originals and turns over to the file clerk all carbons as well as closed cases and statements that have served their purpose. On new cases, the file clerk sets up new file numbers, but on old cases he has the file reference on the letter. In entering the old case, he merely puts the date and to whom sent under the caption "Sent." On new cases, he enters under the same heading and fills in the entire item in the same manner as described in "Incoming Mail." Thus a complete written record is maintained.

A moment's study of Fig. 2 reveals:

Cross Filing

The greatest bugaboo encountered in a subject file is brought about by one letter referring to more than one subject. As example, refer to Fig. 3, the second item, File 2-2, in which C. B. & Q. car 150123 is concerned. This case naturally is entered under "Accidents to Trains" as the car was derailed. Months hence, an inquiry relative to this car may come in with no reference to its being in an accident. To guard against inability to locate entry of this kind, two entries are made in the file book, the first under accidents and the second in the "Foreign Car" section of the file book

under the letter C. In making the last entry, instead of entering a C unit number, a reference is made under the caption file number thus: Refer to 2-2. In other words, a cross index is set up—another great help to the file clerk. The more extensive the application of the cross index system, the greater the efficiency derived.

Tracing

There are numerous index systems for tracing for answers to letters, which automatically call attention by tabs to the date a tracer must be sent out, but these ideas are found to be too cumbersome for the railroad file. The easiest method is simply to run through the open file periodically, once a week being good practice, and to send out pencil tracers on a printed tracer form, keeping a carbon copy of the tracer attached to the file. In the event a second tracer is necessary, it is sent out marked conspicuously, "second tracer."

The File Book

The file book is of the loose-leaf type with a key lock which permits of a quick insertion of file pages, which, of course, have perforations to fit the binder posts. The file sheet is of hard finish paper, as all entries are made in ink to make record permanent. These sheets are 15 in. wide by 18 in. deep, ruled as shown in Fig. 1.

Fig. 5 gives an exaggerated view of manner in which index tabs are pasted on the file sheets. As these index tabs should remain in the book permanently, a suggestion to increase their life would be to affix them to a blank sheet made of a tough paper.

The tabs are of leather, printed on both sides, abbreviating the subject and showing the file number. The general file tab is larger than the sub-file tabs. (Fig. 5 shows the use of sub-file tabs: as an example, under the general file, train delays, divisions one, two and three are made and each of these divisions is given a letter as a sub-file. A letter pertaining to engine failures in general would be entered under general file one; one pertaining to a divisional case would be entered on a sub-file record, etc.)

List of Subjects

To show how this system has been used in mechanical department work, a list of general file and sub-file numbers, with subjects, is given in the table below:

The list of subjects given above has been adopted as a standard but it may be cut down or added to, at will. The more subjects covered, the less cross-filing is necessary, and the greater opportunity the file clerk has to allocate his files.

It will be noted that the system goes into sub-file tabs extensively. This feature is decidedly important and should be given considerable thought in the event of adopting this system. It is true that the greater the number of index tabs, the greater the cost of the file book, but the division of subjects through this medium greatly enhances the value of the system.

Fires on Right-Of-Way

Received	Sent	Date	Location	Description	File No. 15-B
12-1 5		11/29/20	Logansport	To Meadow of J. Brown	15B-1

Fig. 4

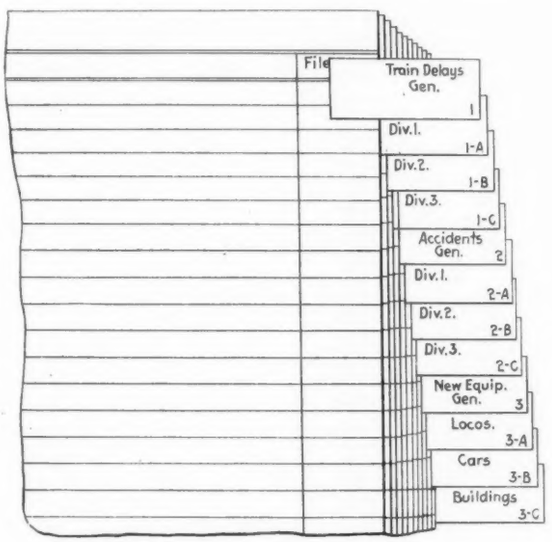


Fig. 5

File Number	Subject	File Number	Subject
1	Train Delays and Engine Failures	15-B	Fires, Right-of-Way
1-A	Train Delays and Engine Failures, Div. 1	16	Force and Allotment
1-B	Train Delays and Engine Failures, Div. 2	17	Time-Keeping
2	Accidents to Trains	18	Auditing
2-A	Accidents to Trains, Div. 1	19	Promotion
2-B	Accidents to Trains, Div. 2	20	Increase in Wages
3	New Equipment	21	Personal Injuries—General
3-A	New Equipment, Locomotives	*21-A	Personal Injuries, A
3-B	New Equipment, Passenger Cars	*21-B	Personal Injuries, B Etc., to
3-C	New Equipment, Freight Cars	*21-Z	Personal Injuries, Z
3-D	New Equipment, Miscellaneous	22	Personal Injuries, Trespassers
4	Foreign Cars	23	Stock Killed
*4-A	Foreign Cars, A	24	Locomotive Cranes
*4-B	Foreign Cars, B Etc., alphabetically, to	25	Stock Cars
*4-Z	Foreign Cars, Z	26	Roadway Machines
5	Foreign Locomotives	27	Wrecking Outfits
6	Tests, General	28	Machine Tools
6-A	Tests, Locomotives	29	Shop Tools
6-B	Tests, Cars	30	Repairs to Locomotives
6-C	Tests, Miscellaneous	31	Repairs to Cars, Passenger
7	Inspection	32	Repairs to Cars, Freight
7-A	Inspection, Locomotives	33	Box Cars
7-B	Inspection, Passenger Cars	34	Gondola Cars
7-C	Inspection, Freight Cars	35	Stock Cars
8	Interchange of Foreign Cars, Freight	36	Flat Cars
9	Interchange of Foreign Cars, Passenger	37	Dump Cars
10	Locomotive Boilers	38	Work Cars
11	Stationary Engines	39	Tank Cars
12	Bridges and Buildings	40	Caboose Cars
13	Power Plants	41	Coaches
14	Bills	42	Mail Cars
15	Fires, General	43	Baggage Cars
15-A	Fires, Buildings	44	Dining Cars
		45	Club Cars
		46	Pullman
		47	M. C. B. Rules
		48	Costs
		49	Conventions
		50	Circular Letters
		51	Miscellaneous

*These files are run alphabetically by car initial or name of injured.

Circular Letters

File number 51 is "Circular Letters." A splendid idea has been incorporated in the system to cover this feature. By way of explanation; a letter may be sent out to all concerned covering changes in standards, general instructions, etc., each letter bearing an individual number prefixed by the letter X. The first letter written may be given File 50-1

but it would also carry a mark "Circular Letter X-1." Each circular issued demands an acknowledgment.

All papers pertaining to this letter are filed under the circular letter number and cross filed to the subject covered, one copy of the circular letter (without any attachments) being filed in a separate box. By this method, the file clerk has three means of locating his file.

The foregoing describes the system as it has been applied in the mechanical department, but the application of it could be made general in railroad practice. A study of the particular subjects in the various departments for the purpose of applying general file numbers is all that is necessary.

Gasoline Explosion at Memphis*

On January 24, 1921, vapors from a tank car of gasoline on the Union Railway spur on Front street, Memphis, Tenn., became ignited and resulted in a blast that killed 11 people and badly injured 19 others. Probably 40 or 50 men, women and children received slight injuries from falling debris or from burns. The explosion wrecked an oil plant, levelled a block of frame buildings and broke window panes within a radius of five blocks, the estimated loss being $200,000.

The gasoline contained in the car was a volatile product known as absorption gasoline with a gravity of 81.5 deg. Baumé, initial boiling point of 80 deg. F. and end point of approximately 360 deg. F. The car was spotted on Saturday, January 22, and the following Monday morning, January 24, a negro workman at the plant opened the tank car without relieving the pressure within. The pressure of vapors that existed in the car is not known although it has been said that the relief valves had been giving off vapors previous to this time. This statement has not been verified but

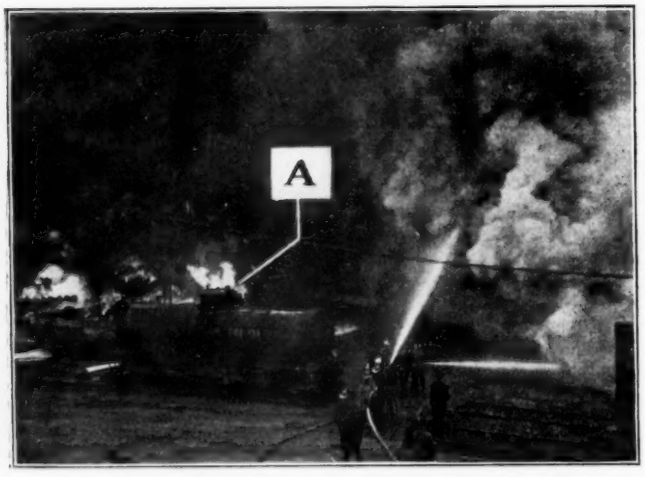


Fig. 1. View Showing Dangerous Fire Following Explosion of a Tank Car of Gasoline

probably there was a pressure of nearly 25 lb., at which the valves popped. The removal of the dome cover resulted in the sudden relief of pressure and gasoline vapor and liquid gasoline boiled out of the dome head in large quantities. The wind from the west in carrying these vapors across the street, mixed them with air and formed readily ignitable mixtures. The vapor became ignited by open fires in the frame buildings on that side of the street and instantly there was a terrific explosion which demolished every house on the west half of that block, as well as destroying buildings in the blocks north and east. This explosion was followed by a second and more muffled one which was made by the flame flashing back to the tank car where vapors issuing from the dome caught fire and burned as they came out. The damage on the west side of the track in the oil plant itself was due largely to the fire that followed. This fire caused the destruction of a garage containing four automobiles, the ruin of a warehouse of sheet iron construction and the loss of several hundred barrels of oil and grease stored therein. These drums of oil caused several minor explosions and, upon breaking, burned with intense heat.

To add to the danger of the fire, there were seven 11,000-

Fig. 2. Wreckage of Homes in Immediate Vicinity of Explosion

gal. tanks filled with gasoline and kerosene, which stood opposite the garage in the oil plant, and five more tanks elevated against a concrete wall at the west side. A second car of absorption gasoline, spotted at the same time as the one which exploded, was vented and the escaping vapors burned as shown at *A*, Fig. 10. The storage tanks also were vented at the top with nipples enclosing wire gauze and as vapors formed and passed out of these vents into the air, they burned quietly. Neither the second tank car nor any of the tanks, shown in the background of Fig. 2, were damaged in any way. It is interesting to note that after the fire had been extinguished, the car from which the explosion originated was still about half full of gasoline. The car was damaged only slightly and the wooden foot boards were only partly burned.

The serious results of this explosion demonstrate once more the need for ceaseless vigilance in handling tank cars of gasoline or other volatile liquids which may explode. In handling gasoline, the Interstate Commerce Commission regulations require that a car, when loaded, must have a certain voidance above the gasoline. This voidance is to take care of any expansion of the liquid which may occur if it becomes heated in transit. Safety valves are provided which will relieve any pressure above 25 lb. within the car. These valves should always be opened before the tank car is unloaded. In case pressure develops, the car can be sprayed with water and the resultant cooling will condense the greater part of these powerful vapors, thus reducing the pressure measurably.

Another way to relieve the pressure is by leaving the valve open and allowing the gas to dissipate slowly. In addition, there are in the dome cover several holes above the threads which will allow the escape of vapors before the cover is entirely removed, thus warning a man when there is pressure within. In no case should the dome cover be removed until this pressure is relieved.

*The account of this explosion is taken from a special bulletin issued by the Bureau of Explosives and the report of an investigation conducted by the Department of the Interior, Bureau of Mines.

Hearing on Burlington and Lackawanna Financing

Interstate Commerce Commission Hears Oral Arguments on Proposals to Capitalize Expenditures from Surplus Earnings

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION enjoyed a brief respite on February 14 and 15 from its usual procedure of listening to the "hard luck" stories of needy railroads by turning its attention to the problems of two of the most successful and prosperous companies, the Chicago, Burlington & Quincy and the Delaware, Lackawanna & Western, that have applied to the commission for authority to capitalize improvements and extensions made during past years out of surplus earnings and to distribute the new securities or their proceeds to the stockholders. The applications have been under consideration for some time by the commission's Bureau of Finance and its Division 4, consisting of Commissioners Daniels, Eastman, Meyer and Potter, and both hearings and arguments had been held before the director of the Bureau of Finance, but it was announced on February 10 that the two cases had been assigned for oral argument before the commission itself and that discussion was desired of the following questions among others:

1. To what extent, if any, should the applicant be permitted to capitalize its surplus (a) into stocks, (b) into interest bearing obligations?
2. In what way will granting the application benefit, or, denying it, injure (a) the applicant, (b) any other common carrier, (c) the public?
3. What special or emergency features are there in the application which would warrant exceptional treatment in granting or denying it?

As these are the first cases since the commission opened its finance docket to go to the full membership of the commission, their assignment for special argument was taken to indicate a difference among the members of Division 4, but the cases also represent the most important that have come before the commission under its new function of regulating the issuance of securities. The questions asked by the commissioners during the argument indicated no particular hostility to the proposals of the two carriers but it was apparent that some of the commissioners desired a full discussion as to one or two points involving the relation of the applications to the specific requirements of the statute. There were no signs that the commissioners were particularly impressed by the arguments advanced by the representatives of the Nebraska state commission that the possession by the Burlington of a large surplus is evidence of excessive rates or that it constitutes a trust fund belonging to the public, but questions were asked intended to bring out clearly what benefit the Burlington would derive from the plan of financing proposed as distinguished from the benefits to be derived by the Great Northern and Northern Pacific companies, its two principal stockholders, that desire the proposed dividend from the Burlington to help retire the joint 4's which mature on July 1.

The argument in support of the Burlington application was made by Hale Holden, president of the Burlington, and by C. W. Bunn, general counsel of the Northern Pacific and E. C. Lindley, general counsel of the Great Northern. The application was opposed by John E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners; Hugh LaMaster, assistant attorney general of Nebraska, and B. C. March, executive secretary of the Farmers' National Council.

Arguments for the Burlington Application

The Burlington's application is for authority to create a new general mortgage and to issue $109,000,000 of 50 year, 6 per cent bonds, of which $29,000,000 would be held in the treasury and $80,000,000 sold to provide funds for a cash dividend. The company also asks authority to issue $60,000,000 of additional capital stock as a stock dividend and it has been stated that the rate of dividend would be reduced from 8 per cent to probably 6 per cent.

Mr. Holden made the opening argument outlining the history of the Burlington and the facts in the case. He pointed out that the acquisition of the Burlington by the two northern lines in 1901 had accomplished the same purpose as an extension of the Burlington to the Pacific Coast and an extension of the northern lines to Chicago and the great markets of the Burlington territory, and was, therefore, a logical development, the wisdom of which has been demonstrated by its success. The Burlington then proceeded with a program of intensive development of its own property, which has now reached a mature condition under honest, efficient and economical management. The capitalization has not been increased, but has been actually reduced and a surplus has been accumulated wholly beyond any need of a surplus, as that term is commonly understood, for the purpose of a reserve. He agreed that a prudent reserve should always be maintained if possible and stated that the company proposed to reserve about $114,000,000. He pointed out that this is a special case based on a special set of facts and entitled to special consideration.

He gave figures showing the enlargement of the plant called for by increasing tonnage and pointed out that substantially none of the $200,000,000 expended for improvements has been devoted to non-productive improvements. Also, he said, the company has not used its funds for extraneous enterprises. The ton mileage of freight handled per mile of road has increased 197 per cent with a decrease of 20 per cent in train miles per mile of road. He said that the expenditures have produced results in the public interest and the company is still in the stage of increasing returns. Moreover, the company is not likely to stand still; the great Mississippi Valley is capable of much greater development and even with the increased capitalization, Mr. Holden said, there can be no sensible argument that the company should not be able to continue to accumulate a surplus. Under its present financial structure, however, Mr. Holden said, the company is headed into the jaws of a tight situation because its present general mortgage is limited to $300,000,000 and to 5 per cent interest. Five per cent bonds cannot be marketed except at a discount and under the mortgage they could not be retired before maturity. The company proposed a ratio of bonds to stocks of three to one, but that represents a maximum and the commission has power at any time to restrict it in connection with its decision on any part of the bond issue.

Chairman Clark said he had been hearing for years that too large a proportion of bonds in relation to stock represented dangerous financing and he asked why there is an apparent change of view in this case. Mr. Holden said he agreed with the general proposition that it is better to finance with stock than with bonds, if possible, but that the stock of the Burlington could not be sold at a fair price at this time. The company's fixed charges have been reduced in 20 years by $422,000 a year and the additional bond issue will in no way impair the credit of the company. The purpose of the bond issue is to provide cash to aid the stockholders in meeting a very heavy maturity, the joint 4's secured by the Burlington stock as collateral, and if it were not for this situation the company probably would not be proposing a

bond issue at this time. In reply to a suggestion by Commissioner Eastman that the Burlington ought to be able to issue stock, Mr. Holden said it would be possible, but it would be more expensive than an issue of bonds. Commissioner Potter remarked that the proper ratio to consider is not the ratio between bonds and stock but the ratio between bonds and stock plus surplus. Mr. Holden also pointed out that the company might have now had the money in the bank available for cash dividends because it might have issued bonds to represent the improvements.

In reply to a question as to the benefit of the proposed issue to the Burlington, Mr. Holden said it is just as important to preserve the present relation of the Burlington to the Great Northern and the Northern Pacific as it has been for the last 20 years. Commissioner Meyer asked if the approval of the proposed financing plan would in any way affect the commission in connection with its consideration of consolidations. Mr. Holden said that the companies would hope that the commission would approve of the relation of the three companies, but that it would not be foreclosed in any way from taking such action with reference to a consolidation as might seem advisable at the time.

C. W. Bunn, general counsel of the Northern Pacific, pointed out the importance to the Burlington of having a new general mortgage because to issue the amount of bonds that have already been approved by the Illinois commission would practically close the mortgage and the Burlington would then have three closed mortgages covering practically all its lines and would have no credit for a new mortgage. Referring to the proposed $60,000,000 stock dividend, Mr. Bunn said that it was conceded that bonus stock should not be issued, but that this stock has been paid for in advance by the earnings which have been devoted to improvements instead of to dividends. He also declared that the stock dividend would be totally valueless to the stockholders because it would result in a lower dividend rate and simply dilute their stock. Its purpose is merely to provide a proper base for the bond issue and the two northern lines have not the slightest intention of disposing of it. He also pointed out that the capitalization of the Burlington is only about $31,000 a mile, or not more than half that of other roads in its territory. The $119,000,000 of bonds that have been authorized by the Illinois commission, he said, had not been issued because of the disturbed conditions created by the war and because of the low rate of interest. The company could have issued bonds during the 120 days after the passage of the Transportation Act before the provisions relating to the issuance of securities became effective, but it was thought more becoming to put the question up to the commission. Mr. Bunn said that the plans for meeting the maturing of the joint bonds on July 1 cannot be fully matured until the commission renders its decision but it is proposed to use the proceeds of the $80,000,000 Burlington bond issue to pay off that amount of the joint bonds and that it has been planned to refund the balance of $135,000,000 to $140,000,000 either by new joint issue or by the issuance of separate bonds by the two companies. He pointed out that the Burlington stock can no longer be used as collateral at $200 a share as it was for 20 years because under present laws only one-third of the collateral behind a collateral trust bond can be stock. The northern lines would have to use mortgage bonds to the extent of two-thirds. Without the proposed dividend from the Burlington, Mr. Bunn said it would probably cost 8 per cent to refund the joint bonds with a new joint collateral trust obligation and the interest charge would, therefore, be about $17,000,000. If $80,000,000 can be retired the balance could be met by issues of mortgage bonds at 6½ per cent, on which the interest charge would be only $13,500,000 so that the plan would result in a total saving of about $3,500,000 in interest.

Opposing Arguments

B. C. Marsh, executive secretary of the Farmers' National Council, opposed both the Burlington and the Lackawanna applications on the ground that they would require the public to pay rates on fictitious capitalization.

J. E. Benton, general solicitor of the National Association of Railway & Utilities Commissioners, used a similar argument, saying that the stockholders of the Burlington have always received reasonable dividends so that the surplus represents excessive earnings. He also discussed the surplus as if it were a reserve fund and said that the accretions of a reserve belong to the fund and not to the stockholders. He also argued that it had not been shown that the proposed issue would be of any benefit to the Burlington itself. Commissioner Eastman said that one of the strongest arguments in favor of the plan was that the issue of $80,000,000 by the Burlington would enable the two northern lines to retire that amount of bonds and to make a total saving of interest charges. Mr. Benton said that the needs of the northern lines have nothing to do with the cost and that any issue by the Burlington must be for the proper purpose of that company.

Hugh LaMaster, assistant attorney general of Nebraska, said that his brief had raised the point that the Transportation Act seems to contemplate that the Interstate Commerce Commission shall consider the law of the state in which a railroad has been chartered, but he did not press the point in his argument. He opposed the application on the ground that the applicant is only nominally a party at interest and that the exigencies of the Great Northern and the Northern Pacific are not proper ground for granting the application. He took the position that the Burlington surplus represented the contributions of the people in the Burlington territory through excessive rates. Commissioner Daniels insisted that the people have merely paid for service rendered and that they have received what they paid for. He also said it made no difference if dividends had been paid at the rate of 100 per cent on the stock; the question involved is whether the owners of the road have received more than a fair return on the value of the property. Commissioner Potter asked what should have been the company's policy in providing improvements and whether they should have been paid for by bond issues. Mr. LaMaster said that securities should have been issued for extensions and when the surplus got sufficiently large the rates should have been reduced. Commissioner Potter asked why if the company should have issued securities from time to time it should not be allowed to issue securities against the expenditures now. Mr. LaMaster said that in the former case the money would have been furnished by the markets of the world instead of taken from the people who paid the rates. He also asserted that the surplus represents a trust fund belonging to the people and that its disposal after the rates have been collected is a judicial and not a legislative function. He admitted that there is no question that the legal title to the property is with the railroad. He also argued that the Burlington has not shown any need of additional capital and that it has always been able to provide for its requirements out of earnings.

When E. C. Lindley, general counsel of the Great Northern, began his closing argument, Commissioner Ford asked particularly for discussion as to the relation of the proposed issue to the necessities of the Burlington as distinguished from the necessities of the stockholders. Mr. Lindley referred to the Burlington's need for a new mortgage and pointed out that the Illinois commission had already authorized $119,000,000 of bonds and that when the Transportation Act substituted the judgment of the Interstate Commerce Commission for that of the Illinois commission the company naturally proceeded to try to make the bonds just as liquid as they were before. The law does not require,

he said, that there must be an affirmative benefit to the Burlington provided the issue is consistent with its purposes, compatible with the interests of the public and will not impair the ability of the company to serve the public. It is to the interest of the Burlington, he said, that the $60,000,000 should be permanently capitalized and it is also to its interest, as well as that of the two northern companies, that the relation between the three companies, which has been beneficial to all three, should be continued. He pointed out that the Gould lines had built to the Pacific coast and had been bankrupted; also that the extension of the Chicago, Milwaukee & St. Paul to the coast had resulted disastrously, whereas the plan adopted by the Burlington and its two northern connections had been a tremendous success. It is to the interest of the Burlington that the two northern lines remain its avenues to the Northwest and enable it to compete with the Union Pacific and other lines. It is also to the interest of the Burlington, as well as to all other railroads, that so large an issue as $215,000,000 should not be refunded at 8 per cent as this would affect the credit of every railroad in the country. The proposed plan is the best one that the companies have been able to think of because it uses the credit of all three roads to make a saving of $2,500,000 to $4,000,000 in interest charges. It is also to the interest of all railroads that the rights of stockholders shall be protected. For the commission to deny this application, he said, would serve notice on all roads that they could no longer retain surplus earnings without running the risk of never being able to get them out and would result in every railroad paying out every dollar of net earnings in dividends currently.

In reply to assertions that the surplus represents excessive rates, Mr. Lindley said that the total return on the investment in the Burlington had been less than the 6 per cent which the law declares to be a fair return and its rates throughout the greater part of the period under discussion have been largely made by the interstate or state commissions.

In concluding, Mr. Lindley pointed out that the time for taking care of the joint bonds is rapidly approaching and that it would be practically impossible now to develop any other plan. It would take 75 days, he said, to give the necessary legal notice and prepare for a special shareholders' meeting. The proposed plan has already been approved by 99 1/3 per cent of the stockholders, including holders of three-fourths of the minority stock, and none of the minority stockholders voted against the plan.

Lackawanna Application

The application of the Delaware, Lackawanna & Western for authority to issue additional stock to the amount of approximately $90,000,000 or approximately twice the amount of the present issue, was discussed briefly by W. S. Jenney, general counsel of the company. After reviewing the history of the road and its finances, he said that the Lackawanna is one of the very few roads in the country that should be able to continue to earn over 6 per cent on its value and that the capitalization should be made more consistent with the value. He said that to increase the number of shares of stock would be of benefit to the stockholders, although in fact representing no more property, because the additional pieces of paper bearing a lower rate of dividend would sell for more in the markets than the present issue bearing a high rate of dividend.

Alfred P. Thom, general counsel of the Association of Railway Executives, closed the argument with a discussion of the broad principles involved, asserting that if the public interest is not injured, the method to be adopted is for private management to decide. The question for the commission, he said, is whether the proposed plan will in any way operate against the public interest. If it will not, it is not necessary for the commission to inquire as to whether the carrier is affirmatively benefited. That question comes within the domain of private management. The statute should not be construed to allow the commission to usurp the functions of private management. The issue of stock dividends to represent actual investment already made, he said, is a lawful purpose within the corporate powers of the company and in the case of the Lackawanna the proposed plan will tie $40,000,000 of assets to the company that are not tied to it now because the amount may be declared as a cash dividend. Mr. Thom argued at length that the carrier has absolute title to its earnings under lawful rates and said that no accumulation of earnings have ever been declared by a "respectable" court anywhere to belong to anyone but the lawful stockholders.

Maturities of Railway Funded Debt

THE BUREAU OF RAILWAY ECONOMICS has made a compilation from the annual reports of the carriers to the Interstate Commerce Commission showing the total maturities of the funded debt of the Class 1 carriers. The details are given as to maturities on mortgage bonds, collateral trust bonds, income bonds, miscellaneous obligations and total for each year to 1949 and from then on by decades.

The compilation follows:

RAILWAY FUNDED DEBT (ACTUALLY OUTSTANDING) MATURING EACH YEAR FROM 1920 TO 1949, AND EACH TEN YEAR PERIOD THEREAFTER.

Railways of Class I - United States

Year of maturity	Mortgage Bonds	Collateral Trust Bonds	Income Bonds	Miscellaneous Obligations	a Total
1920	$102 096 600	$33 088 000	$3 898 000	$15 090 140	$154 174 740
1921	73 904 585	227 013 900	-	21 554 288	322 472 773
1922	57 983 500	44 579 000	-	33 633 260	136 195 760
1923	77 657 000	4 636 000	-	354 597	82 647 597
1924	9 088 000	3 000 000	-	7 812 447	19 900 447
1925	143 423 570	44 991 630	-	48 391 252	236 806 457
1926	47 112 000	24 288 000	-	468 597	71 868 597
1927	55 793 448	7 260 000	-	26 979 823	90 033 264
1928	121 772 100	38 699 500	-	44 597	160 516 197
1929	95 693 754	98 293 000	18 892 062	83 814 593	296 693 409
1930	84 178 600	-	4 543 907	22 275 853	112 998 360
1931	154 101 520	4 705 000	6 000	15 044 597	173 857 117
1932	32 629 000	3 000 000	10 000 000	50 410 397	116 039 397
1933	118 454 535	-	-	72 000 597	184 455 132
1934	228 453 000	16 000 000	9 104 000	80 143 744	333 700 744
1935	55 069 000	-	13 849 250	115 386 111	184 304 361
1936	103 641 000	-	-	44 597	103 685 597
1937	119 573 717	4 840 000	-	5 246 697	129 660 414
1938	120 557 445	8 349 000	1 349 500	1 404 597	131 660 542
1939	147 998 339	-	890 450	4 505 665	153 394 451
1940	145 877 340	-	-	5 044 597	150 921 937
1941	113 826 150	-	-	44 597	113 870 747
1942	75 091 000	-	-	5 138 597	80 229 597
1943	105 535 149	-	2 000 000	44 597	107 579 746
1944	43 555 000	-	-	44 597	43 599 597
1945	100 519 660	-	286 250	44 597	100 850 507
1946	69 328 500	40 176 000	370 000	44 597	109 919 097
1947	157 310 000	-	-	10 035 597	167 345 597
1948	164 207 805	7 272 000	-	38 565 797	210 045 602
1949	234 466 800	34 100 500	25 007 000	44 597	293 618 897
1950 to 1959	1 176 507 704	128 059 700	69 570 643	88 057 274	1 462 195 321
1960 to 1969	779 042 094	-	49 156 923	10 071 000	838 270 017
1970 to 1979	51 350 000	-	-	-	51 350 000
1980 to 1989	340 910 000	20 118 000	18 095 000	-	379 123 000
1990 to 1999	1 019 060 505	9 143 000	51 346 000	-	1 079 549 505
2000 to 2009	154 750 305	11 180 900	24 661 125	5 500 000	196 092 330
2009 & upward	186 820 300	-	-	-	186 820 300
Not distributed	5 337 743	-	7 615 000	16 776 246	29 728 989
Total entire period	6 888 178 767	812 793 130	310 641 110	784 082 135	a 8 795 696 142

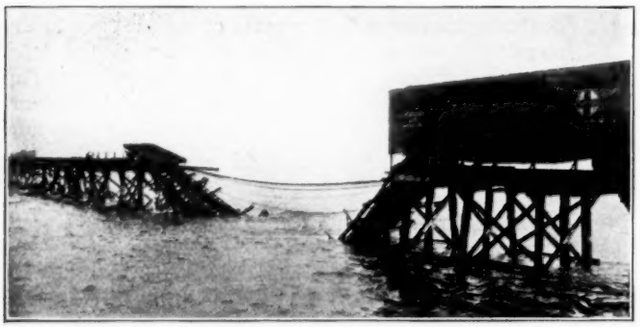
a Does not include equipment obligations amounting to $271,161,225 and also $11,750 receipts outstanding for funded debt. Adding these amounts to the total of $8,795,696,142, the total funded debt actually outstanding of the railways of Class I amounted to $9,066,869,117 on December 31, 1919, which is approximately 82% of the total funded debt of all steam roads in the United States. Foregoing returns do not include data for the Pittsburgh, Shawmut and Northern R.R.

T. O. EDWARDS, auditor of the Southern Pacific, discovering that a number of employees of the road have lost liberty Bond savings and other "nest eggs" through misrepresentation of unscrupulous promoters, has issued the following warning: "No matter how attractive the proposition may seem to be on the surface, employees, before investing their savings, should consult with some responsible banker in their community who will gladly give them frank and unbiased advice, whether they are a patron of the bank or not. There are many opportunities for sound and profitable investments at the present time, but attempts are being made every day to defraud the public and impose upon the credulous."

Marine Borers Invade Piling in San Francisco Bay*

Serious Losses to Railway and Other Structures Along Waterfront Threatened by Teredo

EARLY in 1914, the activity of marine borers was noticed in the dykes of the Mare Island Navy Yard, at the upper extremity of San Pablo Bay, which is the northern arm of San Francisco Bay, as well as at two nearby points on the east shore of that bay. One of the latter was a dock between Crockett and Vallejo Junction and the other a dock at Oleum, a mile or so south of Crockett. Sporadic attacks of marine borers are reported to have been observed in that region at isolated times running as far back as 1870. In any case, these attacks were of short duration and did no serious damage. The waterfront structures erected by the industries were



Dock at Oleum, Calif., Which Failed in 1919 and Plunged Several Cars into the Bay

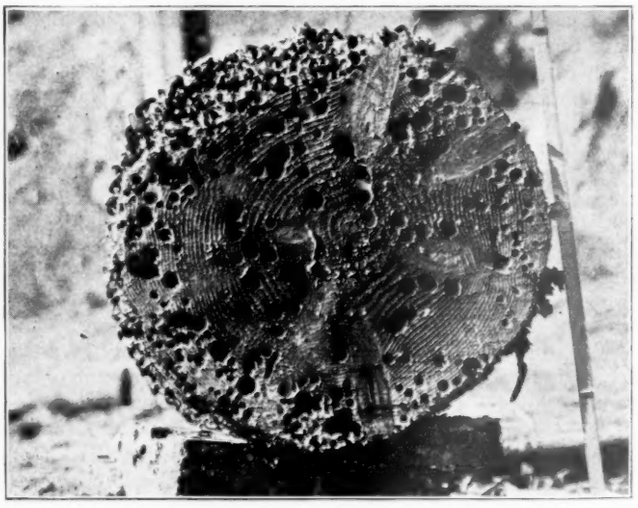
all built on untreated piling, because of the absence of marine borer activity in those waters and the belief that the fresh water discharged into San Pablo bay from the combined flows of the Sacramento and San Joaquin rivers would probably prevent any invasion of San Pablo bay by salt water, which would carry with it the various forms of marine borers.

The attack of 1914 appeared to be sporadic, like the earlier ones. But at Mare Island in 1917 attacks by the same shipworm, which was identified as a teredo, again appeared, and during the following years spread very rapidly. In 1920 these failures assumed such proportions and became of such frequent occurrence that the critical nature of the local situation was brought to the attention of the officials of the American Wood Preservers' Association on June 16, 1920. As a result, a special committee was appointed on July 22, 1920, to study the marine piling problem in San Francisco bay, with instructions to report at the seventeenth annual meeting of the association at San Francisco in January, 1921. The committee began its active work late in July, 1920.

Shortly before June 16, 1920, but practically coincident with the above action, the Forest Products Laboratory of the United States Forest Service at Madison, Wis., had proposed a plan for the study of the marine piling problem covering the entire coastal waters of the continental United States. It was the logical step to unite both proposals, and the San Francisco Bay Marine Piling Survey became, therefore, the first unit of the proposed nation-wide program of the Forest Products Laboratory, under joint co-operation with the American Wood Preservers' Association. The committee was organized with Frank D. Mattos, manager treating plant, Southern Pacific, Oakland, Cal., chairman, and included some 20 engineers connected with industries and railways interested in this problem.

The objects of the survey were to determine the extent of the damage from marine borers in San Francisco bay, especially that of excessive severity which has occurred within the last three years in the northern portion of the bay; to determine the present distribution of the several marine borers and as much of their past history in the bay as it was possible to learn; to increase the present knowledge of the dissemination, growth and habits of the borers; to study the factors influencing the rate of attack and amount of damage from them, including the effect of climate and river discharge upon the salinity conditions in the bay; to throw more light upon the effectiveness, both in physical life and economic advantage, of the various methods of protecting wooden piling, and of the substitutes for it, together with the best methods of construction which have been developed; and to correct data on the relative costs of the different methods of protection and construction.

The name "San Francisco Bay" is technically applied only to the larger and more important southern arm of the body of water which has its connection with the Pacific Ocean through the Golden Gate. The name is more often



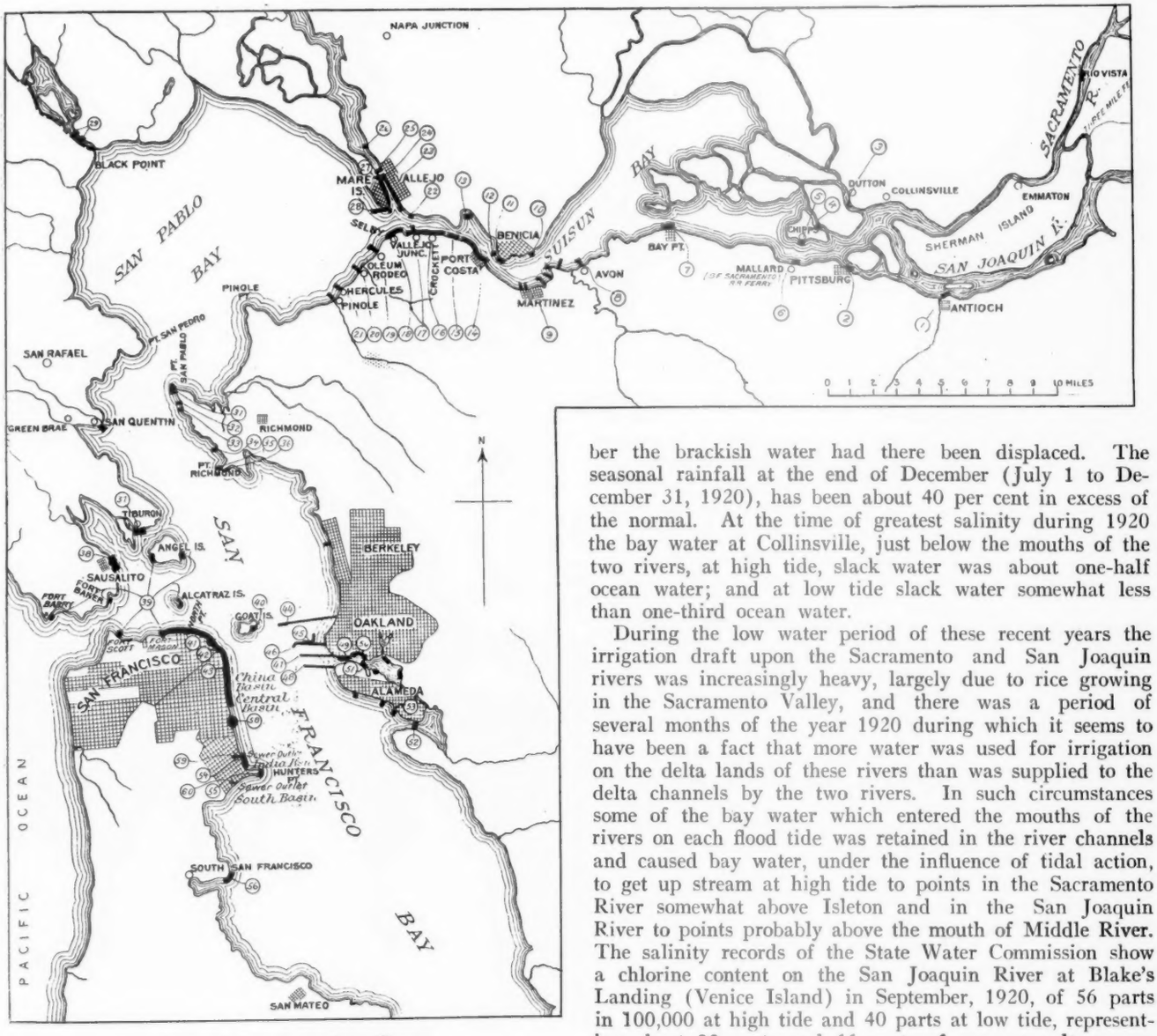
Action of Xylotrya (Large Holes) and Teredo (Smaller Holes) in Pile After 2½ Years' Service

used than any other, however, when it is desired to indicate the entire body of water. This larger bay has its longer dimensions closely parallel to the seacoast. It is 52 statute miles in its greatest length in a single direction, and has a maximum width of slightly under 12 miles. The outlet through the Golden Gate is at a point about three-fifths of the total length of the bay from south to north. At a point about one-half of the remaining distance north from the Golden Gate the width of the bay is reduced to a little over one mile, and that point marks the division between San Francisco Bay proper and the upper area known as San Pablo Bay.

*Abstracted from an elaborate report of the San Francisco Bay Marine Piling Committee of the American Wood Preservers' Association, and presented at the annual convention of that association in San Francisco on January 2.

At the eastern end of San Pablo Bay there enters a channel known as Carquinez Straits, through which the combined flow of the Sacramento and San Joaquin rivers is discharged into San Pablo Bay. The Carquinez Straits are from seven to eight miles in length and above them is a large area of water composed of many tidal flats and salt marshes known as Suisun Bay. At a point about 18 miles above Carquinez Straits is the junction of the Sacramento and San Joaquin rivers.

Destruction from marine borers in San Francisco Bay



Map of San Francisco Bay

has been most active in the regions nearest the Golden Gate, where unprotected timber is destroyed within a few months. Destruction is nearly as rapid southward around the San Francisco waterfront. On the Oakland side destruction is somewhat less rapid, unprotected piling lasting from 18 months to three years. In the Oakland estuary the activity of limnoria is greater than that of the xylotrya and piling may be destroyed in as short a time as six months.

In the northern area, including the lower course of the Sacramento River, Suisun Bay, Carquinez Straits and the adjacent portions of San Pablo Bay, many of the piling structures, although built wholly of untreated wood, had stood from 30 to 40 years. The destruction there since 1917 by the teredo has been swift and unusually severe. Every waterfront structure as far upstream as Antioch has been attacked by the teredo. This year (1920) the waters of Suisun Bay had reached their maximum salinity about the middle of September and, a few weeks later, particularly after the winter rains commenced, the increasing flow of the rivers accelerated the freshening of the water in the upper end of Suisun Bay, so that by the middle of November the brackish water had there been displaced. The seasonal rainfall at the end of December (July 1 to December 31, 1920), has been about 40 per cent in excess of the normal. At the time of greatest salinity during 1920 the bay water at Collinsville, just below the mouths of the two rivers, at high tide, slack water was about one-half ocean water; and at low tide slack water somewhat less than one-third ocean water.

During the low water period of these recent years the irrigation draft upon the Sacramento and San Joaquin rivers was increasingly heavy, largely due to rice growing in the Sacramento Valley, and there was a period of several months of the year 1920 during which it seems to have been a fact that more water was used for irrigation on the delta lands of these rivers than was supplied to the delta channels by the two rivers. In such circumstances some of the bay water which entered the mouths of the rivers on each flood tide was retained in the river channels and caused bay water, under the influence of tidal action, to get up stream at high tide to points in the Sacramento River somewhat above Isleton and in the San Joaquin River to points probably above the mouth of Middle River. The salinity records of the State Water Commission show a chlorine content on the San Joaquin River at Blake's Landing (Venice Island) in September, 1920, of 56 parts in 100,000 at high tide and 40 parts at low tide, representing about 92 parts and 66 parts of common salt, respectively. The highest salinity was shown by the samples taken on November 22. The chlorine content of the water was then 66 parts in 100,000. This is equivalent to about 99 parts of common salt in 100,000 parts of water. The situation relating to the up-river penetration of bay water is aggravated by the fact that the work of channel enlargement in progress since 1913.

The Xylotrya

The cosmopolitan character of the distribution of the marine borers depends upon the ease with which their larval stages may be carried by currents of the sea, or in the water tanks of steamers, and upon the facility with

which the borers themselves may travel long distances in driftwood, in exposed wood of vessels or in timber rafted by sea. This makes it a biological certainty that all great ports are subject to repeated invasions by borers from other localities.

The xylotrya is the largest of the three borers found in the bay. When full grown in our waters it measures as high as two feet in length and has a diameter at the head or shell-bearing end of three-fourths of an inch. Tubes over three feet in length and seven-eighths of an inch in diameter have been found in old piling on the San Francisco waterfront. Its burrows differ from those of the two species of teredo found in San Francisco Bay in two important particulars. They are larger and they present continuous minor deviations from the straight or curved course which teredo pursues. Their burrows are therefore less symmetrical and regular than those of teredo. The burrow of xylotrya enters the pile at right angles to the surface as a small pin hole and turns obliquely, usually downwards, enlarging rapidly within two inches of the surface to one-quarter inch and within four inches to three-eighths to one-half inch. It does not restrict its course to sap wood, and in cases of sparse seeding of the borers, often bores obliquely deep into the wood before turning to run with the grain of the timber. For this reason, surface samples may not reveal lightly infected piling.

Xylotrya is generally found in association with limnoria in our waters and the two invade the pile together, although it is probable that when once limnoria gets possession of the surface, xylotrya has a small chance to get into wood. However, creosote-treated piling hollowed out by limnoria sometimes has a few xylotrya at work within creosoted shell but not traversing it.

The rate of growth of xylotrya under existing conditions in the bay is seen in the fact that piles in the dolphin off the Alameda Mole, driven in February, 1919, were so weakened at the mud-line, mainly by xylotrya, that they had to be removed in November, 1920, that is in about 20 months. Piling in the neighborhood of the Golden Gate last only six months, owing to the combined action of xylotrya and limnoria. In so far then as our data go, it appears that the principal molluscan borer to be guarded against in the main and lower parts of San Francisco Bay and on the ocean front where salinities are those normal to the sea or approach it is xylotrya.

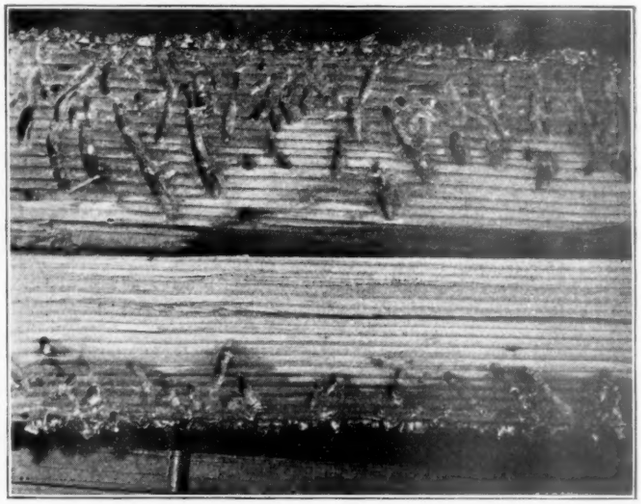
The Teredo

The teredo navalis is the ship-worm of the dykes of Holland. This species is the medium-sized species of the three molluscan borers occurring in this region. It is, when full grown in the autumn, from 4 to 10 in. in length, generally 6 to 8, and the diameter of the head end is from ¼ to ⅜ in. The body lies in the burrow which enters the pile horizontally, and generally, but not always, turns downward at once and expands within one or two inches to a nearly uniform diameter throughout the rest of its course.

The tubes or burrows of teredo differ from those of xylotrya in our timbers in being smaller and somewhat more thickly set or crowded. They enter the piling less deeply than xylotrya, whose burrows, whether few or many, are wont to enter the pile even to the center, while teredo enters deeply by reason of crowding. Moreover, xylotrya works in shallow water less readily than teredo. When crowded the burrows are often only ⅛ in. in diameter. The burrows enter by minute holes 0.008 in. in diameter when first made, but enlarged to as much as 0.03 as the animal grows older. The burrow runs a curved or straight course, often with the grain and downwards when not crowded, or more or less obliquely across it when crowded.

The burrows twist and turn to avoid crossing each other and the direction of the tube may even be abruptly reversed in a short turn, or the inner end abandoned and a new course established at a point above it. They are generally straighter or more regularly curved, and have smoother course established at a point above it. They are subject walls.

The degree of destruction of the timber by excavation is a function of the density of settlement and penetration. In piling with a fairly heavy infection from Port Costa, we



Penetration of Teredo Four Inches Into Green Douglas Fir Pile in Four Months

find that in four samples the average per cent excavated was 45.5 per cent. In densely attacked timber, the percentage of excavation will run somewhat higher than these figures.

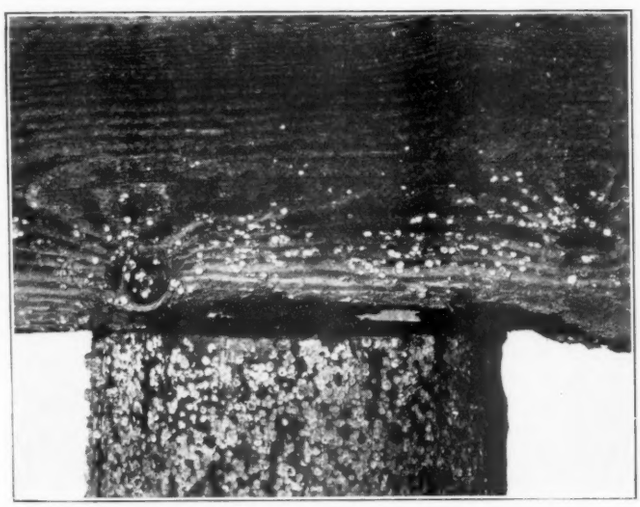
In December, 1919, it was found that teredo had penetrated the piling of the Southern Pacific slips at Port Costa and Benicia two to three inches, and in some instances had almost completely eaten the pile through at the mud-line. A pile pulled at Vallejo Junction in June, 1919, and sawn in two-foot sections, did not contain teredo, nor was it found in surface sampling at low tide on Southern Pacific structures in the upper bay in June, with surface salinities of 3.3 parts per 1,000, but was detected in great numbers on October 15, 1919, in surface and bottom salinities of 22 parts per 1,000, at Vallejo Junction when a steamer broke off some piling, and shortly thereafter at Port Costa and Benicia, in surface salinities of 12.1 and bottom of 17.6 parts per 1,000, in pulled piling. By the autumn of 1920 they spread up stream until they had reached Antioch on the San Joaquin, 25 miles above Carquinez Straits and 50 miles from the Golden Gate, and up the sloughs of the Delta to Dutton.

This progressive invasion was the direct result of the continued shortage in the annual rainfall and run-off during these years, which permitted the settling of the larval stages on unprotected piling during the breeding season of midsummer and the survival of the borers in the wood during the brief season of the spring freshets of these years. In the upper bay from Pinole through Oleum, Mare Island, Vallejo, Crockett, Port Costa, Benicia, Martinez, to Mococo and Avon, the destruction of piling by this teredo in the summer of 1920 reached a climax which left little or no untreated piling undamaged and not a little of it wholly destroyed by penetration to the center or near it, at the mud-line.

In the meantime the invasion had spread elsewhere to unprotected structures, such as those above Black Point on Petaluma Creek, to the wharves at Richmond, and to the unprotected piling of the dolphins of the Alameda Mole, to some points in the Oakland Estuary, to the Bay Farm Island bridge, and to the Dumbarton cut-off at the southern end of the bay. It was also found during the survey at South San Francisco, in the Bay View sewer outlet, and at the sewer outlet at Hunter's Point, in new piling in the boom at Islais Creek, and sparingly at Pier 7 on the San Francisco waterfront in treated piling which had been opened up by the attack of limnoria. From the distribution thus shown it is to be inferred that all unprotected piling in San Francisco Bay may be expected to show upon examination an attack by this borer.

The Limnoria

In addition to the molluscan borers attacking marine structures described above, there are three others belonging to the crustacea of general distribution, namely limnoria, sphaeroma, and chelura. Limnoria and sphaeroma only have been found as yet in San Francisco Bay. These borers owe their efficiency as destroyers of wood to their powerful biting jaws by which they cut their way into the hardest of wood. They both belong to types of crustaceans adapted to life in the zone of extreme environmental conditions, between tides where moisture, light, salinity, temperature, food supply, and stability of the substrate are subject to rapid and extreme change. The body of the limnoria is small, the largest individuals attaining a length



Failure of a Corbel on Pile Cut Off Too Close to Water, Barnacles Indicate High Water Line

of ¼ in. and one-third as wide. It is elongate slipper-shaped, flattened dorso-ventrally, and has rounded ends.

Limnoria is found on both the Atlantic and Pacific shores of the United States, north to Bering Island, and has been reported on European coasts from the Adriatic to Norway. It is common along the California coast in piling on the ocean front. In San Francisco Bay it is very destructive in the Golden Gate, on the Oakland and San Francisco water fronts, at Dumbarton cut-off and at Sausalito, Tiburon and Richmond. It was not found north of San Quentin and San Pablo Point and took no part in the invasion of the Upper Bay with teredo. It is thus abundant where salinity is not much reduced by fresh water.

Limnoria destroys piling by gnawing its interlacing branching burrows into the surface of the wood. We have found from 200 to 240 burrows per square inch in heavily attacked timber. These burrows are from 0.050 to 0.025 in. in diameter and follow the softer zones of spring growth between the more resinous harder zones of the annual rings. Piling infested by limnoria thus has an outer scurf of ⅛ to 3/16, rarely ¾ in. of perforated somewhat laminated wood, which is readily broken or falls away as the attack proceeds. In square timbers the attack progresses rapidly between the harder zones of the annual rings on radial sections, leaving these resinous strips as projecting ribs.

The borer is particularly insidious in its attacks upon creosoted piling because of its habit of creeping into small crevices. If cracks open through the saturated zone of a creosoted pile or if bolt or dog holes or peavey holes or other breaks in the continuity of this protection occur, limnoria is sure to find its way into the retreat thus offered and to begin its destructive work. It will reduce such a pile to a mere shell. It is sometimes found in such piles actually at work in the creosoted zone itself. Whether it does this because it slowly becomes acclimatized to the repellent substance or because of defective creosoting, low grade oil, or progressive leaching out of the toxic elements of the oil, is unknown.

The proportion of the wood removed by limnoria in its burrows is somewhat less than that removed by teredo. Teredo-eaten piling has a firmer consistency because of the thicker partitions between the burrows. Limnoria-eaten wood is more friable or spongy because of the numerous small burrows and the more or less elastic resin zones left somewhat intact by these borers.

A test of the average amount of excavation in five pieces of Douglas fir squared timber eaten by limnoria from Tiburon showed an average of 42.8 per cent. The considerable number of borers remaining in the burrows somewhat reduces the apparent volume of the excavation. The probability is that it is often in excess of 40 per cent.

The Sphaeroma

The sphaeroma is a larger, stouter form than limnoria, but with the same general structure. The body is broadly ellipsoidal in outline seen from above with rounded ends. It is one-half inch long and one-quarter inch wide and rolls up into a ball about a quarter of an inch in diameter when disturbed. Its color is dark olive to slightly reddish brown. It is often mottled or blotched with lighter dull yellowish areas on the middle of the back. The eyes are prominent and lateral in position.

Sphaeroma is very often found in crevices or other sheltering nooks outside of its burrows and is evidently something of a forager. It does not appear to depend upon the wood eroded from its burrow for food, for its stomach contents are made up of the minute vegetable and other growths which cover the surface of the piling.

The excavations made by sphaeroma pentodon in marine structures are very characteristic in size, distribution and location. They have circular openings up to nearly one-half inch in diameter, enter the wood horizontally or turn more or less abruptly and run with the grain in the softer layers of the wood. They do not exhibit the expansion characteristic of the molluscan burrows.

Sphaeroma works mainly between high and low tide, though found at all levels on piling. Its workings are obscured in deeper water by the more intense activities of limnoria and the growth of other marine organisms. Between tide levels it gives to the piling a pitted appearance with its large, open, dark-colored burrows. Its work is erratic in that often only certain piles are subject to its attacks while neighboring ones may be untouched. It sometimes runs channels on the surface of wood, especially in the more deeply submerged piling.

The sphaeroma has a wide range of distribution in our locality. It has been found at Sausalito, Tiburon, Black

Point, the Mare Island dikes, in Napa Creek, along Carquinez Strait and upstream to Antioch in water of low salinity. It also occurs along the western water front and Oakland Estuary and in the southern part of the bay to South San Francisco and the Dumbarton cut-off. It is known to occur northward to Alaska.

Exterior Indications of Marine Borers

The crustacean borers work upon the surface of submerged wood and leave an open record of their destructive activities in the erosion caused by their burrows. Limnoria and chelura erode so rapidly that few other forms of marine life can obtain, or long retain a foothold on the wood in which these borers are working.

In the case of the molluscan borers, the case is different. They enter the wood as minute larvae and leave only a pinhole to mark the places. There is nothing to indicate to the casual observer either their presence or the degree of destruction which they have accomplished.

The survey of the Sacramento River to Sacramento brought out the fact that certain forms of marine life had gone up the river as far even as Walnut Grove, and that these same forms were luxuriantly thriving on piling attacked in Carquinez Straits, as salt water had invaded that territory. They serve, therefore, as indicators to the uninitiated that the sea with its fauna is invading new territory. These marine organisms are the barnacles and the hydroids. The former are well-known crustaceans encased in an armor of shelly plates which cover piling, rocks, ships' bottoms, and any available substrate with hosts of more or less close-set, whitish, angular bodies ranging up to a hazel-nut in size. The hydroids are moss-like plant-animals which form a grayish or brownish mass or, when dead, hair-like growth over piling.

There is fortunately another marine animal of cosmopolitan distribution, the European edible mussel, mytilus edulis, whose somewhat angular black shell is attached to rocks, piling and any stable or floating substrate. The occurrence of young mussels on marine piling is a danger sign for the engineer to look out for teredo.

There is one outstanding feature of the present outbreak of marine borers in San Francisco Bay and of this survey which affects State and Federal supervision of navigable waters and of shipping and engineering practice in the construction and maintenance of marine structures, such as wharves, moles and piers. It is this, namely, that within the area infested by marine borers all unprotected woodwork is a potential breeding ground for harboring these pests, increasing their numbers, and sending forth their migrating larvae. In every case an infected bit of wood is a contagious spot. A single infected pile in 25 ft. of water and its 100 sq. ft. of surface affords shelter for upwards of 150,000 teredos, and each of these is capable of producing more than 2,000,000 larvae per year. Each pile, barring the death rate of larvae, thus produces enough young to seed 2,000,000 other piles.

The Engineering Problem

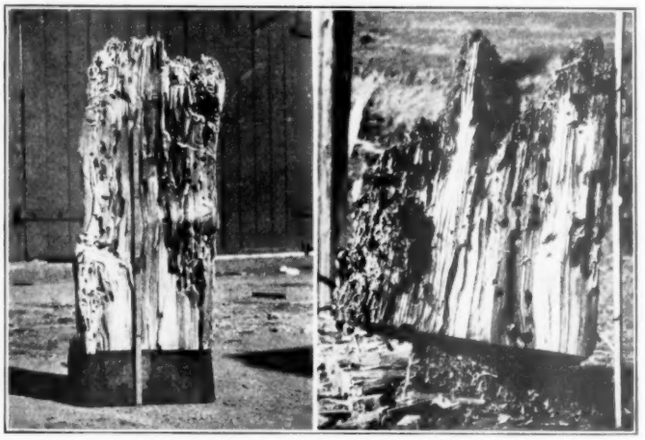
To the engineer responsible for the design, construction and maintenance of structures in sea water, accurate information on the relative cost and the permanence of various kinds of piling and pile protections is of the greatest importance. After describing the various methods of protecting piles in some detail, the committee concluded that:

(1) Marine borers are very active in San Francisco Bay, and in places where their attack is severe will destroy untreated piling in as short a time as six to eight months. In other places the untreated piling may last two to four years.

(2) The information secured indicates that it is reasonable to expect a life of five to eight years from paint and batten protections if the work is well done. If it is not well done or if the covering is damaged by careless handling this range of life cannot be expected.

(3) When carefully handled so that there is no injury extending through the shell of treated wood within the water section, it appears possible for properly creosoted Douglas fir bearing piling to give a life of 25 to 30 years in San Francisco Bay.

(4) Most of the attack on creosoted piling by marine borers, which the committee has observed throughout this survey, appears to have begun in spots where untreated wood has been exposed by damage in handling the piles or placing the superstructure. It is urgently recommended that improvements be made in the methods of handling



Section of Untreated Douglas Fir Pile After 7 Years' Service

Pile Broken from Pier After 2½ Years' Service

creosoted piles and building structures upon them, so that damage to the surface of the piles may be reduced to a minimum.

(5) Precast reinforced concrete piles and pile casings have not been in use in San Francisco Bay a sufficient length of time to determine their ultimate life. A detailed examination of those structures which have been in service for 10 years shows no evidence of deterioration and they seem capable of a long further life.

(6) Cast in place concrete pile jackets and cylinders may be expected to give satisfactory results if properly constructed of suitable materials. The difficulties of this type of construction, however, are of such a nature that the probability of securing a maximum length of life is less than in the case of precast concrete piles or pile coverings.

(7) The selection of a type of piling or pile protection for a given structure must be made upon the basis of cost and permanence of the materials under consideration, the character of the structure and the probable need for future alterations to meet the changing requirements of commerce. When a comparatively short increase over the life of green wooden piling is sufficient, the surface protections will often be found economical in waters not exposed to severe storm action; if a moderately long physical life approximating the average economic life of marine structures in this harbor is desired, a good creosote treatment will provide it at the lowest annual cost so far as present knowledge goes; if conditions warrant building for the greatest permanence, with less regard for first cost, concrete construction may be useful. For the protection from further damage of wooden piles already in place and showing attack by borers, not yet severe enough to require condemnation, the concrete casing, precast or poured in place, is the only means of salvage so far found by the committee.

Reading Dissolution Plan Filed at Philadelphia

In Conformance with Supreme Court Decision, Court Asked to Defer Central of New Jersey Sale

THE PLAN FOR THE SEGREGATION of the Reading Company and affiliated corporations decreed by the United States Supreme Court, and modifications suggested by the government were filed with the Federal District Court at Philadelphia on Monday, and March 1 has been fixed to hear argument on the plan.

The plan provides that the Reading Company, a holding concern, will assume the $93,524,000 general mortgage 4 per cent bonds, which are the joint obligation of the Reading Company and the Philadelphia & Reading Coal & Iron Company. The coal company will pay the Reading Company $10,000,000 in cash or current assets at market value and $25,000,000 in 4 per cent mortgage bonds of the coal company. The $25,000,000 bonds to be issued by the coal company to the Reading will mature on January 1, 1997, the same date as the general mortgage bonds. These bonds shall be subject to redemption at par and accrued interest on any semi-annual interest date.

The Reading Company will merge the Philadelphia & Reading Railway Company under the authority of the present charter of the Reading Company and will subject the railway property to the direct lien of the general mortgage. The name of the Reading Company after the merger will not be changed and the company will be subject to federal and state regulations as a common carrier. If and whenever the general mortgage bondholders' committee shall determine to declare the plan of exchange effective the Reading Company shall execute a refunding and improvement mortgage which shall constitute a direct lien upon all the railroad's railroad property, railroad equipment and railroad stocks and bonds then owned by the Reading Company, or thereafter acquired by means of bonds issued thereunder. Deposited general mortgage bonds will be kept alive under said refunding and improvement mortgage until the general mortgage is released.

Plan Asks Court to Defer Jersey Central Sale

The proposed plan asks the court to defer the actual sale of the stock held by the Reading Company in the Central of New Jersey, pending the grouping of railroads by the Interstate Commerce Commission under the Transportation Act, but subject to the further order of the court.

To this last proposal the government has entered an objection and has suggested that the Reading Company shall, "with all due diligence," offer for sale at reasonable price and upon reasonable terms the stock of the Central of New Jersey now owned by it, for a period of years to be named by the court. If at the expiration of such period a sale of the stock has not been made, then, on application of the attorney general, the court may decree a sale at public auction at a price not less than a minimum price to be agreed upon between the Reading Company and the attorney general.

The government's opposition to the proposal to place the Reading Company's interest in the stock of the Jersey Central in the hands of trustees pending the working out of the regrouping of railroads by the Interstate Commerce Commission is because it "means in practical effect a continuance of the status quo indefinitely." The government contends that the consolidation of the railroads of the country would take such a long time that the effect upon the companies involved in the dissolution plan would be to maintain their present status for an indefinite time.

A plan submitted separately provides that the Central of New Jersey shall dispose of all its capital stock of the Lehigh & Wilkes-Barre Coal Company now owned by it to persons or corporations who are not its own stockholders or stockholders in either the Reading Company, the Philadelphia & Reading Railway Company or the Philadelphia & Reading Coal & Iron Company, and who previous to or at the time of the purchase shall qualify as purchasers by a duly executed affidavit. Should all of the said stock not be disposed of before the expiration of six months after entry of this decree or previous to any date which may be fixed by the court, the remainder shall be transferred to the Central Union Trust Company of New York, as the custodian and depository of the court, subject to the provisions of this decree and to the further orders and decrees of the court.

In accepting this plan, Judges Buffington, Woolley and Davis modified a decree previously entered enjoining the Central of New Jersey receiving dividends from the Lehigh & Wilkes-Barre Coal Company so as to permit the railroad company to receive such dividends pending the sale of the coal stock.

Separation of Coal Company

The greater part of the plan is taken up with the dissociation of the coal company from the holding company. It provides that the mortgage under which the $25,000,000 4 per cent bonds are to be issued may contain provisions for the issue of additional bonds to provide for additions and betterments to a limited amount, to be determined by the Reading Company and the coal company prior to the creation of the mortgage. The bonds are to mature January 1, 1997, the same date as the general mortgage bonds.

With certain exceptions general releases of all claims and liabilities as between the Reading Company and the coal company, including the claim of approximately $70,000,000 carried on the books of the Reading Company as an asset and on the books of the coal company as a liability, will be exchanged.

The Reading Company agrees to obtain the release of the coal property from the lien of the general mortgage and the discharge of the coal company from liability on the general mortgage bonds, provided such release and discharge can be secured by payment by the Reading Company to the bondholders of a premium not exceeding 10 per cent upon the par value of the outstanding general mortgage bonds. The Reading Company will make payment of the premiums on the order of the committee to be formed in the interest of the bondholders.

"It is assumed," the plan says, "that the attorney general will ask the court to direct the release of the stock of the coal company from the lien of the general mortgage on such terms as the court may fix. If practicable the coal company will consolidate with the Delaware Coal Company, of which it owns the entire capital stock and the consolidated company will issue stock without par value to the Reading Company. If that is not practicable, a new corporation will be created to acquire from the Reading Company the stock of the coal company or the interest of the Reading Company therein, and such new corporation will issue no par value stock. The number of shares to be issued by the consolidated coal company or of such new corporation may be 1,400,000.

"Such no par value stock will be sold to the stockholders of the Reading Company, preferred and common, share and share alike, for $5,600,000, or $2 for each share of Reading stock. It is proposed to carry out this sale, in accordance with the precedent established by the Union Pacific-Southern Pacific case, by distributing to Reading stockholders, assign-

able certificates of interest in the coal company stock, exchangeable for such stock only when accompanied by an affidavit that the holder is not the owner of any stock of the Reading Company. Any further steps which may be deemed necessary by the court will be taken to the end that an independent board and management to be approved by it will be maintained by the coal company, so that the independence of this company shall not await the necessarily gradual process of distribution of the stock of the coal company among persons not holders of stock in the Reading Company."

The government in a memorandum filed by Assistant Attorneys-General Myers and Nebeker has given its approval to the plan except as to the parts of it relating to the separation of the Reading and Central of New Jersey as above noted and except as to the proposal to convert the stock of the coal company into stock of no par value. Concerning the latter, the government is not altogether satisfied that no other plan is practicable nor is it certain just what the consequences of the proposed plan might be. In general, however, the government is inclined to the view that this is not a matter of consequence as regards the ultimate desire for a complete dissolution between the several corporate defendants, but "at the same time the government cannot refrain from expressing its belief that, if practicable a much better solution would be to secure a fair appraisal of the value of the coal properties and issue capital stock in that amount, and fix the par value per share at an amount which would result in the issuance of a number of shares approximately equal to the number of shares of Reading Company outstanding."

The Reading Company is a proprietary and not a holding company. It owns the entire outstanding capital stock of the Philadelphia & Reading Railway Company, the Philadelphia & Reading Coal & Iron Company, the Philadelphia & Reading Terminal Company, the Reading Iron Company and $14,504,000 of the outstanding $27,436,800 stock of the Central of New Jersey, etc. It also owns $20,000,000 purchase money bonds of the Philadelphia & Reading Railway together with certain real estate, part of which was the property of the old Philadelphia & Reading Railroad Company and rolling stock and floating equipment leased to the Philadelphia & Reading Railway Company. The Central Railroad of New Jersey in turn owns $8,489,000 of the $9,212,500 capital stock of the Lehigh & Wilkes-Barre Coal Company.

The Reading Company has stock outstanding amounting to $70,000,000 common, $28,000,000 4 per cent first preferred and $42,000,000 4 per cent second preferred. Of this total of $140,000,000 stock, over $60,000,000 is owned by the New York Central and Baltimore & Ohio as follows: Baltimore & Ohio, $6,065,000 first preferred, $14,265,000 second preferred and $10,002,000 common; a total of $30,332,000; New York Central, $6,065,000 first preferred, $10,002,000 second preferred and $9,852,500 common, a total of $30,182,500.

The case in connection with which the present dissolution plan was filed, was begun in the form of a bill in equity instituted by the United States government in the district court for the eastern district of Pennsylvania in September, 1913, alleging violations of the anti-trust law, the commodities clause of the Interstate Commerce Act, etc.

In a decision in July, 1915, the court refused to sustain the government's contentions with the exception of that relating to the control of the Lehigh & Wilkes-Barre Coal Company by the Central of New Jersey. The court said, "In the carriage of coal the Reading Railway and Central Railroad are not competitors" yet "they reach the same general field, the same general source of supply and carry a similar article to many of the same markets." The court held "the union of these interests in the holding company is condemned by the rule laid down in the Northern Securities Case." The court stated, however, that it was not disposed to disturb the ownership of the Reading Company in the Central of New Jersey "unless the friendly and mutually advantageous alliance of the two railroads in this particular (with respect to traffic other than coal), must be destroyed in order to reach the unlawful combination in another particular that would otherwise escape."

The case was appealed to the Supreme Court by the defendant companies and also the government. In its decision on April 26, 1920, adopted by a vote of 4 to 3, the court sustained the government's contention that the Reading Company controls railroads and coal companies in violation of the anti-trust laws, and declared that the Reading Company and its associates constituted a monopoly in anthracite coal and ordered its dissolution. The decree ordered a dissolution of the combination of the Reading Company, the Philadelphia & Reading Railway Company, the Philadelphia & Reading Coal & Iron Company, the Central Railroad of New Jersey, and the Lehigh & Wilkes-Barre Coal Company. The court held that "the great power lodged in the Reading holding company, which is the combination of railroads and coal companies, is a flagrant violation of the anti-trust laws of our country." It further held that the organization of the holding company was an attempt to evade the anti-trust law and the Constitution of Pennsylvania.

The effect of the decision of the Supreme Court was to affirm in part and reverse in part, the decision of the lower court, and to remand the case with a direction to enter a decree in conformity with the opinion. The District Court has affirmed "as to the Lehigh Coal & Navigation Company, the Lehigh & New England Railroad Company, the Lehigh & Hudson River Railway Company as to the restrictive covenance in mining leases with respect to the shipping of coal, as to the dissolution of the combination between the Philadelphia & Reading Coal & Iron Company, and the Lehigh & Wilkes-Barre Coal Company, maintained through the Reading Company and the Central Railroad Company of New Jersey." As to the Wilmington & Northern Railroad Company and as to the individual defendants, the bill was dismissed without prejudice. As to the Reading Company, the Philadelphia & Reading Railway Company, the Philadelphia & Reading Coal & Iron Company and the Central Railroad Company of New Jersey, the decree of the District Court was reversed and the case remanded with direction "to enter a decree in conformity with this opinion, dissolving the combination of the Reading Company, the Philadelphia & Reading Railway Company, the Philadelphia & Reading Coal & Iron Company, the Central Railroad Company of New Jersey and the Lehigh & Wilkes-Barre Coal Company, existing and maintained through the Reading Company, with such provision for the disposition of the shares of stock and bonds and other property of the various companies, held by the Reading Company, as may be necessary to establish the entire independence from that company and from each other of the Philadelphia & Reading Railway Company, the Philadelphia & Reading Coal & Iron Company, the Central Railroad Company of New Jersey and the Lehigh & Wilkes-Barre Coal Company, and also that such disposition shall be made by the decree of the stocks and bonds of the Lehigh & Wilkes-Barre Coal Company, held by the Central Railroad Company of New Jersey as may be necessary to establish entire independence between these two companies to the end that the affairs of all these now combined companies may be conducted in harmony with the law."

Judges Buffington, Woolley and Davis in the U. S. District Court at Philadelphia on October 8, 1920, filed an order fixing 90 days from that date for the filing by the Reading Company of a plan of dissolution in conformity with the decision of the U. S. Supreme Court, but the time was later extended.

Some Present Day Problems of the Railroads*

Magnitude of Railroad Business Difficult to Comprehend—Necessity of Reducing Operating Costs

By Daniel Willard
President, Baltimore & Ohio

THERE ARE MANY PROBLEMS confronting the railroads, and many confronting all of us. The railroad problems are seasonal; they are periodic; and they are economic. I think, however, that the most constant and persistent problem that confronts the railroads at all times, through all seasons and all periods, is the problem that grows out of being misunderstood. The railroads are such a large undertaking and we have to talk in figures that we so little comprehend that this difficulty is ever present.

First of all, we talk about an American railroad system, and there is not any such thing as an American railroad system in the sense that there is an American telephone system, for instance, which has wire communication under the same general control from one part of the United States to another. No one ever visualized the railroads in that sense, because their development has been quite unlike that of the telephone. The railroads helped to develop the country. The telephone came in after the country was developed.

Billions Are Hard to Comprehend

When we speak of the American railroad system we, of course, have something in mind, and while it is not a concrete system under one control, like the Pennsylvania Railroad, we will say, it is in a general way a system that coordinates with itself, but is made up of more than 1,800 separate and independent companies. Now those 1,800 companies have altogether about 260,000 miles of main line. They own about 2,300,000 freight cars and about 60,000 locomotives, and something like 55,000 cars designed for passenger train service. So far I have been able to discuss the matter and keep within terms of millions. But immediately we begin to discuss the earnings, the costs and performance of the property, we get into terms of billions. But we cannot discuss the railroad problem without talking in billions. For instance, the books of the carriers show that this great property has cost something like twenty billions of dollars to start with. It depresses many people when they think how much money we must have in the property and how much of it probably we did not get properly. It is because the size is so great that that feature is misunderstood in the beginning.

Then we try to talk about the performance of the railroads. Immediately we say they earn six or seven billions of dollars a year and some one says that is as much as the value of all the farm crops in a certain period and consequently there must be something wrong about it. But the railroads not only carry the crops from the farms, but they perform a general service for all the people in the United States that can only be put in concrete terms when we say they carry 448 billions of ton miles a year. No one understands, certainly I do not, what is meant by this figure. I have no definite conception of 448 billions of ton miles. I can put it in another way and comprehend it a little better. For instance, it works out this way: the railroads carry 4,000 tons one mile every year for every man, woman and child in the country. Putting it another way: they carry ten tons 400 miles for each inhabitant of the country. Then in addition to that they carry billions of passenger miles, which no one understands, but again when these passenger miles are resolved into somewhat simpler terms, they are the equivalent of 400 miles of travel annually by every man, woman and child in the country. Now when we consider the amount of traveling for every individual to me it does not seem so unreasonable when it is said the railroads tax each person, if it is a tax, some fifty or sixty dollars a year. My own investigation leads me to think that the people get more for $50 or $60 a year which they pay the railroads, than they get from any other concern or undertaking to which they pay money.

The trouble is that we talk in such big figures all the time that no one understands what we are talking about. When we get into billions, millions become minimized. They lose their relative value. To illustrate: I saw not long ago a statement by the statistician of the director general of railroads—he was pointing out the accomplishments of federal control—and he said that one of the outstanding accomplishments was this fact: the director general was able to re-route the business so as to cut out circuitous routes which had saved the movement of 17,000,000 car miles a year. Well, 17,000,000 car miles is a great many car miles to save a year, and if we were in the habit of discussing this problem in terms of millions, no doubt it would have a relative value of some importance, but when you consider that the total car miles which the railways moved in the year was 23,000,000,000, then your 17,000,000 becomes .07 of one per cent.

The Seasonal Problem

The other problems I have said are seasonal, periodic and economic. Take the seasonal problem. One of them which I call seasonal was the situation that confronted the railroads last summer. We had just come out of a war. There was banked up, so to speak, a great amount of goods to be moved. During the war the government had not been able to keep up increasing the facilities of the railroads. During the war there was a most prodigious increase of all kinds of productive capacity in our country. Farmers cultivated more land, old factories were enlarged, new factories were built, and all that sort of thing; but the railroads stood still. It happened that in spite of the fact that some people said they had broken down, they were, nevertheless, able to move all the things necessary to carry on the war, and consequently nothing was done to increase their facilities—that is to say, nothing of real permanent value.

Heavy Requirements and a Depreciated Plant

For instance, the director general during the 26 months' period of federal control, bought 100,000 freight cars. Now 100,000 freight cars is a lot of freight cars, but we wear out almost a hundred thousand every year—50,000 anyway—and he bought in the 26 months only what the railroads themselves were in the habit of buying every twelve months. So you can see at the end of the war, after having sustained unusual service, the railroads were not only inadequately equipped, but their equipment was in an impaired condition. I do not speak of that to criticize at all. I am simply telling you the facts so you will understand the situation. When the roads were turned back to their owners on March 1 of last year, the owners of the properties were called upon to perform the largest service of transportation ever performed

*An address delivered before the annual meeting of the National Civic Federation at New York.

and with this plant which had been allowed to depreciate.

During the war movement of materials for road building, for house building and for other projects not necessary in conducting the war was virtually stopped. When the war was over, everybody wanted to ship all at once. The railroads were confronted with a difficult task and their immediate problem was a very vital one, at least from the standpoint of those who favor the continuation of private ownership and control. So from that point of view, this particular problem developed last spring: Is it possible for 1,800 different railroad companies to so function and work together that they can, under private ownership with government regulation, perform in the aggregate as great an amount of service as they could perform if they were unified under one general manager or director general?

Last summer the roads—the 1,800 separate companies working together in a common interest—appreciated that it was expected of them that they should do as much as had been done with the same plant under government control. The result was that the combined tonnage carried by all the railroads was 448 billion ton miles, as I have stated. The largest sum ever carried before was 440 billions. So the railroads showed that, acting independently under the present law, they could realize the benefits of unified control just as well as they could be realized under government operation, and as a matter of fact within the same period of time and with the same plant, they carried eight billion ton miles more than the plant had ever carried before. Now, that was one of the problems. I think we got away with that problem rather successfully.

Today's Problem Concern's Net Earnings

Today the railroads are looking for tonnage to carry. I suppose the business the railroads are carrying today is 30 per cent in volume less than it was last summer. And the problem now is no longer how can we give the maximum service with a given plant, but how can we obtain necessary earnings to maintain the institution of private ownership. That is the problem today. It shifts. The problem is never the same from one time to another, except the difficulty of being understood. That is always there. Today the problem is one of net earnings.

Increased Percentage of Gross Earnings Paid for Labor

This matter brings in the cost of operation and leads us immediately to another problem, and a very important one, and that is the labor problem. Now the labor problem is very important with the railroads because so large a part of all the money collected by the railroads is immediately paid out for labor. I suppose at the moment—but I do not know, and neither does any one else know because there are no general figures available at this time—that out of every dollar that the railroads collect at least 60 per cent is being paid out for labor. Before the war that percentage used to vary around 40 to 45. It gradually got up to 60. It is too high. It must come down. Just how it is going to be worked out, I do not know. The railroad rates are as high probably as they ought to be and certainly no one could recommend that they should be raised any more at this time. Still it is a matter of common knowledge that with the rates high as they are, many of the important railroads today are not earning their operating expenses and very few are earning their full interest at the present time.

Now, of course, that cannot go on as a permanent thing and if the rates cannot be increased and the volume of business does not increase, then the cost of doing business must be reduced, or the scheme will fail. I do not think the scheme will fail. I expect business will gradually get some better and finally get back where we would like to see it.

I am not one of those who wants to see conditions back as they were before the war. Take the labor matter. Before the war, it was generally recognized that railway workmen were relatively not receiving as high wages as workmen in other undertakings. There are reasons for that which I need not go into. But the difference became accentuated as we got into the war. Some of the wages of the workers in effect today—many of them perhaps—will probably have to be readjusted downwards. I do not think that the time has come for that as yet. But there is a matter in connection with the labor of the railroads that is demanding serious thought. During the period of federal control the so-called National Agreements were entered into between the director general and the mechanical crafts.

In the working out of those National Agreements conditions arose which, in my opinion, are not right at the present time—if, indeed, they were ever right. The attitude of the railroads before the Labor Board is that those features in the national contract which have the effect of, we will say, discouraging efficiency—have the effect of paying men for work that is not performed—should be eliminated. It is a general thought, too, that the unskilled laborers upon the railroads are perhaps being paid more now than is justified under all the circumstances, because we must bear this in mind: whatever the wages paid by the railroads are, the public must pay through rates and charges. Not only that: if the public should be willing to maintain a rate of wages that is unreasonably high for a certain class of workmen, then the farmers and other employers of the same kind of labor would be obliged to pay similar wages, and that gets into the cost of living. No one wants to see any workman working for a wage that is not fair and is not reasonable, considering all the circumstances.

We will save a considerable sum of money in the purchase of supplies, the price in that connection having gone down materially in the last two or three months. The railroads are reducing their forces now because it is found with a lesser volume of business that so many men are not necessary, and then the older men who are coming back to their original jobs are more efficient, and fewer men do more and better work. This is enabling the railroads to reduce the labor charge somewhat.

Praise for the Transportation Act

Now there is only one other problem I will speak of just now although I might refer to many. That is the problem which must be ever present in the minds of those who favor private ownership and control of the railroads. It is this: does the Esch-Cummins Act make private operation possible? I believe it does. Whether private ownership and operation of the roads continue or not depends upon whether the people want it to continue, and will be satisfied with the service the roads give them. It gets back to the railway managers themselves. If they give the public a service that measurably meets the public requirements, then I believe the public will want private ownership to continue.

I think that perhaps what I have said is sufficient to give an indication of some of the problems that the railroads are trying to overcome at the present time. The most important of all is the difficulty of being understood. The second problem, which is always in reserve, and may be up for discussion at any time, is this: can the railroads, under 1,800 individual companies, co-ordinate their efforts so as to give the maximum service in times of emergency? I say they can because they have. The next is, can they so work out their operations, adjust their costs—labor, material and so forth—so as to live on the rates that the people in this country can afford to pay? At the moment that is our serious problem, but when I reflect that in the past the railroads in this country have paid the highest wages paid by railroads anywhere in the world and at the same time have moved their freight cheaper than it has been moved anywhere else in the world, I cannot help believing that we are going to do it again. I believe we will overcome that problem also.

General News Department

The Western Railway Club will hold a meeting at the Sherman Hotel, Chicago, on February 21, at which G. M. Basford will address the club on "The Foreman." Motion pictures entitled, "For the Good of the Commonwealth," distributed by the Commonwealth Steel Company, will be shown.

Ten Pullman conductors and three other persons have been arrested at Pittsburgh, Pa., on charges of stealing tickets of the Pennsylvania Railroad. It is said that discovery has been made of large thefts carried out by the conductors in taking up tickets and then, through third parties, having them redeemed as unused.

Governor Miller, of New York, has proposed to the legislature that New York harbor (which is also Jersey City harbor) be controlled, so far as State legislation is concerned, by a governor, or governing board, acting under the joint authority of the two states, New York and New Jersey, and that action be taken at once looking to the necessary agreement or treaty between the states.

W. J. Tollerton, general mechanical superintendent of the Chicago, Rock Island & Pacific and chairman of the Mechanical division of the American Railway Association, has been designated as American reporter to the International Railway Congress to be held at Rome, Italy, in April, 1922, on question No. VII—Passenger Carriages.

A list of other reporters and questions to be reported on appeared in the *Railway Age* of June 18, 1920 (page 1925).

The extinguishment of fires on Pennsylvania Railroad property, in the year 1920, by the fire brigade made up of the company's employees resulted, without doubt, in saving much property which, if dependence had been placed wholly on outside firemen, would have been lost. A record of fires put out with the company's apparatus before the arrival of the city fire department shows a loss of only about one-eighth of 1 per cent of the insurance value of the properties endangered. The number of fires thus extinguished was 223, and the loss amounted to only $28,725, whereas the property saved had an insurance valuation of $23,000,000.

Nathan L. Miller, Governor of New York, has proposed to the legislature new statutes radically reorganizing the public service commissions and providing for the relief of the subway and elevated lines in New York City, which are now operating at a loss, the fares being still five cents. The commission for the First District (New York City) would be made one of three members, instead of one member as at present, and would devote itself wholly to matters of "rapid transit." It would have broad powers in the regulation of fares. The commission sitting at Albany (Second District, five members) would regulate all other public service functions throughout the State. It is proposed to make the terms of members fifteen years, so as to minimize political influence.

Treasury Payments to Railroads

The Treasury Department announced on February 14 that it had paid out $181,064,637 to railroads for loans from the $300,000,000 revolving fund; $262,514,874 for advances on account of the six months guaranty, $1,311,700 as final payment of the guaranty, and $841,812 to short lines for reimbursement of deficits during federal control.

Foreign Trade Convention

The National Foreign Trade Council will hold its eighth national convention at Cleveland, Ohio, on May 4, 5, 6 and 7. The present difficulties of our foreign trade will be discussed at length with a view of surmounting them. Particular attention will be paid to the unfavorable exchange situation and there will be, in addition, group sessions to discuss the various problems of those interested in particular phases of foreign trade.

Railroad Guaranty Bill in Senate

The Winslow bill, providing for partial payments to the railroads on account of their guaranty for the six months following the termination of federal control, was considered by the Senate committee on interstate commerce in executive session on Wednesday and it was decided to report the bill out at once with the amendment added when it was passed in the House, in lieu of the Townsend bill to accomplish the same purpose. Consideration of the bill in the Senate has been delayed by appropriation bills but it was expected to take it up and pass it on Thursday, probably at a night session, although Senator LaFollette was expected to oppose it. It it not now expected that the other Townsend bill, which is a substitute for Section 10 of the Clayton law, can be put through at this session but it was to be considered by the Senate committee on Friday.

Hearing on Clayton Law Substitute

A brief hearing was held on February 11 before the House Committee on Interstate and Foreign Commerce on the bill proposed as a substitute for Section 10 of the Clayton law, which was originally introduced by Representative Esch and Senator Frelinghuysen at the request of the Association of Railway Executives, but has been reintroduced by Senator Townsend. It has been favorably reported by the Senate Committee as modified in accordance with suggestions made by the Interstate Commerce Commission. Alfred P. Thom, general counsel for the Association of Railway Executives, and Chairman Clark of the commission advocated the passage of the bill and Chairman Clark urged that, because of the short period remaining of the Congressional session, the form of the Townsend bill be adhered to in the interest of expedition. He pointed out that the provisions of the Clayton law, which have been in effect since January 1, seriously interfere with transactions between railroad companies in a single system and that its application to security issues is inconsistent with the provisions of the transportation act which give the Interstate Commerce Commission complete jurisdiction over security issues.

Reduction of Rates and Wages Proposed in Congress

Representative Black of Texas on February 14 introduced in Congress a joint resolution directing the Railroad Labor Board to make further investigation of wages and salaries paid to railway employees under its decisions of July, 1920, and to make such changes and modifications in such decisions as it may determine are justified in the public interest and will at the same time award railroad employees just and reasonable wages. Mr. Black also introduced at the same time another joint resolution directing the Interstate Commerce Commission to review its decision of July 29, 1920, which allowed increased rates under section 15-a of the interstate commerce act, and to make such reductions, if any, in such rates as it may find to be just and reasonable. The resolutions were referred to the committee on interstate and foreign commerce. Mr. Black had previously made a speech in the House in which he asserted that railroad rates are now too high, but that they were necessitated by the increases in railroad wages made during the period of federal control and last year. He expressed the opinion that to get back to normal the question of rates and wages should be considered together.

Senator Trammell of Florida has also introduced a resolution in the Senate directing the Interstate Commerce Commission to investigate the present high freight rates on citrus fruits, vegetables and other perishable farm products with a view to bringing about early legislation that will result in a reduction of the existing rates on such products.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1920

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
Alabama & Vicksburg	Dec.	141	$229,671	$81,243	$340,583	$70,379	$80,379	$7,889	$146,893	$12,028	$320,449	94.09	$20,134	$5,477	$8,363	—$28,682
	12 mos.	141	2,366,764	884,701	3,540,405	728,540	730,700	82,213	1,491,092	137,275	3,206,527	90.57	233,879	164,174	189,962	—70,560
Vicksburg, Shreveport & Pacific	Dec.	171	304,610	98,593	430,141	36,013	96,521	9,231	159,205	13,428	367,919	85.53	62,223	40,270	16,181	—11,699
	12 mos.	171	2,984,360	1,187,305	4,522,271	917,224	914,076	97,015	1,822,723	153,993	3,948,725	87.32	573,546	389,589	256,985	—190,401
Ann Arbor	Dec.	293	492,417	58,596	571,368	79,857	108,040	8,055	241,151	14,750	451,920	79.10	119,449	101,949	88,922	46,319
	12 mos.	298	4,480,713	715,117	5,528,580	842,818	1,150,553	91,635	2,550,437	179,329	4,815,164	87.75	713,415	504,976	234,739	—335,790
Atchison, Topeka & Santa Fe	Dec.	8,830	11,973,355	5,238,557	18,550,944	3,795,041	4,099,568	278,679	8,067,203	320,707	16,605,338	89.51	1,945,606	1,011,092	1,017,162	—3,757,195
	12 mos.	8,766	141,327,582	54,554,444	215,444,414	42,180,959	50,321,237	2,618,315	79,016,228	4,032,046	177,969,590	82.61	37,474,824	26,704,007	27,108,499	—12,926,771
Gulf, Colorado & Santa Fe	Dec.	1,907	2,018,644	582,117	2,689,283	689,280	653,779	39,125	918,534	67,898	2,366,834	88.01	322,449	266,337	198,486	—223,769
	12 mos.	1,912	19,084,411	6,531,346	27,548,089	7,546,689	6,094,019	372,307	12,303,336	719,387	26,997,028	98.00	551,061	—362,509	—1,065,927	—3,499,788
Panhandle & Santa Fe	Dec.	857	594,294	177,152	814,503	247,383	354,092	3,232	304,552	16,864	925,971	113.69	—111,468	—31,503	—63,475	—178,088
	12 mos.	815	6,806,880	1,988,289	8,355,874	2,509,658	3,210,629	59,206	3,942,322	218,563	9,932,936	106.17	—577,062	—748,977	—1,170,252	—956,776
Atlanta & West Point	Dec.	93	136,634	102,131	268,355	36,930	55,067	7,126	108,662	11,241	224,156	83.53	44,198	—43,023	—40,624	—58,364
	12 mos.	93	1,512,642	1,149,300	3,040,401	432,159	545,291	75,289	1,190,344	120,199	2,414,715	79.42	625,686	445,531	380,055	—155,987
Western of Alabama	Dec.	133	128,403	84,334	234,363	52,997	64,156	8,174	97,026	11,081	237,032	101.14	—2,668	21,135	—36,354	—103,928
	12 mos.	133	1,563,377	945,486	2,786,398	467,266	617,809	76,356	1,072,374	105,115	2,383,376	85.57	403,023	307,778	298,885	—259,924
Atlanta, Birmingham & Atlantic	Dec.	639	316,055	96,028	448,733	100,609	108,097	25,759	259,769	18,655	513,039	114.33	—64,306	—105,662	—93,903	—44,129
	12 mos.	639	4,200,061	1,056,415	5,750,591	1,429,569	1,689,432	258,131	3,199,855	232,882	6,810,992	118.44	—1,060,401	—1,294,040	—1,296,060	—342,885
Atlantic Coast Line	Dec.	4,887	5,031,891	2,285,438	7,938,362	855,156	1,469,258	109,291	3,155,716	152,391	5,785,727	72.88	2,152,634	1,919,215	1,957,106	441,609
	12 mos.	4,889	47,984,404	19,187,189	73,633,763	12,431,732	16,267,160	972,057	34,494,724	1,685,443	66,304,717	90.05	7,329,045	4,052,059	3,908,649	—3,235,681
Charleston & Western Carolina	Dec.	342	222,496	60,689	301,611	68,390	60,525	7,676	142,432	8,298	287,323	95.26	14,288	—814	—9,075	—30,081
	12 mos.	342	2,600,215	669,900	3,471,736	866,401	775,742	69,242	1,932,100	76,177	3,719,661	107.14	—247,924	—384,786	—557,097	—719,872
Baltimore & Ohio	Dec.	5,153	16,591,417	2,977,350	21,074,826	3,087,511	6,059,661	287,326	10,208,621	582,262	20,362,319	96.62	712,507	22,999	—436,880	—296,366
	12 mos.	5,153	182,710,629	31,183,371	231,944,443	33,059,283	68,872,816	2,757,205	113,804,109	6,107,370	226,284,047	97.56	5,660,396	—1,162,437	—4,224,884	—9,307,309
Baltimore & Ohio Chicago Term.	Dec.	90	.....	.....	254,264	14,144	68,386	1,667	187,741	11,098	286,941	112.85	—32,677	—64,250	6,561	2,949
	12 mos.	90	.....	.....	2,356,796	461,192	681,316	17,514	1,957,768	138,133	3,315,377	140.67	—958,581	—1,324,680	—417,870	—635,773
Staten Island Rapid Transit	Dec.	23	92,036	92,357	203,129	39,255	33,303	2,240	139,881	14,987	229,666	113.06	—26,537	—30,100	—48,830	—6,540
	12 mos.	23	1,000,246	1,169,250	2,415,150	613,635	403,052	19,345	1,471,381	144,889	2,652,301	109.82	—237,151	—390,544	—626,228	—685,331
Bangor & Aroostook	Dec.	658	484,919	110,659	596,159	110,435	162,283	4,135	272,114	25,463	581,378	97.52	14,781	—32,871	—3,162	—13,287
	12 mos.	658	5,222,459	1,119,247	6,740,098	1,421,513	1,583,626	45,632	2,602,896	234,028	5,982,438	88.76	757,661	428,861	822,738	718,194
Belt Ry. Co. of Chicago	Dec.	31	.....	.....	485,687	44,324	42,700	1,102	291,338	10,510	389,973	80.30	95,713	70,946	127,754	—22,059
	12 mos	31	.....	.....	4,730,854	648,590	812,756	9,993	2,907,135	109,363	4,487,837	94.86	243,017	—37,358	1,631,070	10,611
Bessemer & Lake Erie	Dec.	225	1,173,648	55,703	1,261,516	101,914	461,884	18,198	499,161	44,846	1,134,849	89.96	126,668	—1,036,296	—802,877	—139,080
	12 mos.	225	14,883,354	527,974	15,790,560	1,761,304	4,470,901	177,947	5,315,624	376,520	12,201,084	77.27	3,589,476	2,256,454	4,787,988	2,854,429
Bingham & Garfield	Dec.	36	28,611	1,711	32,420	15,246	5,802	2,271	13,745	4,216	41,876	129.17	—9,456	—52,955	—37,952	—67,635
	12 mos.	36	1,351,730	20,259	1,399,493	348,042	318,128	23,244	353,358	54,246	1,106,130	79.04	293,363	171,718	320,817	406,173
Birmingham Southern	Dec.	29	56,733	.....	72,649	4,639	9,818	1,131	35,625	2,759	53,972	74.30	18,677	16,627	9,370	21,826
	12 mos.	29	480,949	.....	660,336	54,212	103,037	11,886	383,940	41,777	594,852	90.64	65,484	43,358	—22,871	—46,099
Boston & Maine	Dec.	2,304	4,534,931	2,033,613	7,256,550	697,954	1,647,699	34,843	4,148,950	290,285	6,854,347	94.44	402,203	139,602	—94,965	1,007,170
	12 mos.	2,300	53,409,512	24,668,711	86,715,564	14,581,034	19,845,653	666,803	50,480,501	3,123,222	89,160,841	102.83	—2,445,276	—5,338,490	—9,836,167	—13,004,884
Brooklyn Eastern District Terminal	Dec.	9	96,292	.....	105,088	5,155	22,935	10	47,243	6,266	81,609	77.66	23,478	17,129	17,189	49,165
	12 mos.	9	1,082,716	.....	1,193,520	145,836	337,942	1,665	736,381	54,150	1,275,973	106.91	—82,453	—157,320	—168,571	195,910
Buffalo & Susquehanna R. R. Corp.	Dec.	252	289,709	10,552	304,480	29,177	120,234	2,525	107,617	15,247	274,800	90.25	29,680	15,305	63,441	122,508
	12 mos	290	2,974,911	87,535	3,114,961	584,465	1,340,066	30,803	1,130,936	129,686	3,215,956	103.24	—100,995	—202,645	270,748	683,749
Buffalo, Rochester & Pittsburgh	Dec.	589	1,854,485	198,547	2,098,830	256,930	556,129	17,645	883,655	47,745	1,764,495	84.07	334,334	282,321	437,486	621,149
	12 mos.	589	18,997,979	1,914,947	21,712,290	3,594,079	6,505,687	213,903	9,807,591	517,826	20,662,470	95.16	1,049,821	632,120	2,413,858	3,462,834
Canadian Pacific Lines in Maine	Dec.	233	311,127	63,379	390,331	25,299	77,733	4,329	248,437	5,970	361,677	92.66	28,654	6,494	—21,868	96,075
	12 mos.	233	2,143,877	588,654	2,890,171	787,137	709,123	38,670	1,861,840	46,153	3,442,692	119.12	—552,521	—718,781	—888,752	—288,279
Carolina, Clinchfield & Ohio	Dec.	291	668,623	52,159	734,992	101,432	178,129	22,073	258,404	24,635	584,443	79.52	150,549	140,394	252,518	67,168
	12 mos.	291	6,904,856	546,005	7,634,329	1,017,954	1,809,220	214,680	2,442,167	253,097	5,734,624	75.12	1,899,705	1,526,365	2,807,330	1,319,393
Central of New Jersey	Dec.	686	3,954,669	725,219	4,961,690	—336,360	3,446,210	33,241	2,726,764	113,999	6,034,668	121.63	—1,072,978	—1,434,581	—1,405,170	—1,022,604
	12 mos.	686	38,574,636	9,775,182	51,989,304	6,638,988	19,288,580	404,087	26,998,405	1,273,114	54,939,153	105.67	—2,949,849	—6,291,280	—5,852,417	—7,236,971
Central Vermont	Dec.	413	449,904	121,548	620,434	114,941	167,711	16,529	364,698	27,168	691,336	111.43	—70,902	—77,363	—79,826	—53,161
	12 mos.	413	5,165,123	1,303,344	7,173,646	1,260,443	1,994,927	128,103	4,666,841	259,626	8,333,142	116.16	—1,159,495	—1,379,930	—1,529,887	—696,068
Chesapeake & Ohio	Dec.	2,527	7,042,828	1,217,939	8,645,800	1,000,096	2,357,957	64,277	3,565,977	164,473	7,175,864	83.00	1,469,937	1,239,755	1,155,963	1,819,436
	12 mos.	2,519	72,433,294	11,814,187	90,190,745	12,850,938	24,579,561	690,362	37,363,046	1,810,741	77,704,879	86.27	12,485,866	9,645,906	11,357,968	3,894,013
Chicago & Alton	Dec.	1,050	1,917,724	633,517	2,733,143	205,344	874,780	54,754	1,392,680	58,171	2,591,430	94.81	141,713	68,484	—1,720	—36,620
	12 mos.	1,050	20,818,536	6,950,981	30,374,934	4,582,234	8,655,127	485,296	14,068,980	770,040	28,667,649	94.38	1,707,285	919,056	—268,746	—38,500
Chicago & Eastern Illinois	Dec.	1,130	2,316,876	531,072	3,093,557	202,463	1,162,541	37,779	1,281,010	76,652	2,774,238	89.68	319,319	243,619	401,536	223,537
	12 mos.	1,131	22,445,849	5,443,894	30,896,865	3,848,501	10,262,437	328,450	13,298,333	994,874	28,893,933	93.52	2,002,931	878,737	2,546,080	3,001,149
Chicago & North Western	Dec.	8,405	7,935,199	3,145,877	13,161,607	1,816,556	3,067,339	177,544	6,858,450	420,760	12,454,611	94.63	706,996	—222,277	—290,209	927,425
	12 mos.	8,301	109,720,442	37,430,655	165,029,625	27,949,770	38,786,335	1,473,414	79,263,769	4,295,515	153,209,445	92.84	11,820,180	3,234,232	969,876	—11,708,874

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1920—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.					
Chicago, Burlington & Quincy	Dec.	$9,370	$11,231,398	$3,137,377	$15,271,911	$2,303,116	$4,679,979	$184,202	$7,895,486	$563,326	$15,745,537	103.10	—$473,626	—$1,476,154	—$1,892,244	—$2,366,382
	12 mos.	9,371	130,188,268	36,527,379	184,610,987	31,226,882	42,051,642	1,760,528	81,626,406	5,162,550	163,711,352	88.68	20,899,634	12,295,164	8,012,046	—17,144,486
Chicago Great Western	Dec.	1,496	1,438,079	490,776	2,087,567	367,181	514,789	66,172	1,001,374	63,619	2,032,028	97.34	55,539	—14,329	—60,926	—121,437
	12 mos.	1,496	15,840,108	5,694,505	23,889,976	5,749,492	6,393,597	506,763	11,202,177	703,737	24,771,160	103.69	—881,183	—1,735,088	—2,652,371	—3,746,050
Chicago Junction	Dec.	12	.....	.....	395,726	57,036	91,028	278	246,422	10,993	405,758	102.52	—10,032	—14,242	30,009	28,032
	12 mos.	12	.....	.....	3,600,429	656,916	742,884	3,163	3,617,314	124,147	5,144,423	142.88	—1,543,994	—1,583,852	—1,275,476	—1,193,296
Chicago, Milwaukee & St. Paul	Dec.	10,605	9,222,774	2,604,431	13,199,829	1,394,927	3,207,632	171,412	6,491,378	415,863	11,737,706	88.92	1,462,122	989,266	755,667	2,076,325
	12 mos.	10,623	116,790,894	31,112,244	167,771,947	28,390,296	42,171,295	1,624,378	81,955,971	5,178,001	160,436,517	95.63	7,335,430	—84,620	—5,819,216	—8,954,066
Chicago, Peoria & St. Louis, R. R.	Dec.	247	193,714	33,634	237,915	37,580	96,848	5,220	142,420	13,223	295,292	124.12	—57,377	—64,548	—66,704	50,065
	12 mos.	247	2,287,841	337,548	2,801,194	500,425	953,903	56,090	1,506,415	141,748	3,158,514	112.76	—357,320	—440,702	—474,605	393,901
Chicago, Rock Island & Pacific	Dec.	7,663	7,412,669	2,820,750	11,177,108	1,685,103	2,437,471	179,890	5,376,234	278,537	10,003,678	89.50	1,173,430	695,487	535,476	1,006,511
	12 mos.	7,642	90,061,232	33,984,289	135,258,495	25,179,593	33,460,408	1,716,988	61,935,840	3,204,903	125,804,798	93.01	9,453,697	4,028,571	1,590,488	—6,628,263
Chicago, Rock Island & Gulf	Dec.	461	544,705	122,462	702,383	100,660	87,910	11,737	310,806	17,475	529,421	75.38	172,962	159,296	146,733	25,325
	12 mos.	461	4,912,566	1,352,460	6,767,657	1,058,908	1,186,400	124,039	3,061,745	183,530	5,629,447	83.16	1,138,210	960,778	948,142	218,151
Chic., St. Paul, Minn. & Omaha	Dec.	1,749	1,639,823	706,620	2,665,318	284,538	507,087	40,809	1,358,684	94,944	2,298,759	86.25	366,559	230,958	205,284	156,149
	12 mos.	1,749	20,845,728	8,272,351	31,911,606	4,907,551	6,273,265	380,648	15,251,523	981,493	27,957,339	87.61	3,954,268	2,376,599	2,420,322	—256,923
Chic., Terre Haute & Southeastern.	Dec.	374	655,904	30,838	701,675	103,667	339,761	6,179	279,920	13,206	745,607	106.26	—43,931	—63,786	—45,149	—67,414
	12 mos.	374	5,782,377	306,622	6,245,409	947,501	2,221,072	59,913	2,579,900	140,266	5,974,749	95.67	270,660	39,305	620,500	904,339
Cincinnati, Indianapolis & Western.	Dec.	321	280,277	76,923	388,283	72,281	101,641	10,276	174,632	22,464	382,857	98.60	5,426	—8,245	—5,884	66,297
	12 mos.	321	3,389,515	753,513	4,481,147	839,301	1,430,423	113,837	2,146,253	242,198	4,786,397	106.81	—305,250	—498,637	—532,853	64,665
Colorado & Southern	Dec.	1,099	1,403,068	259,582	1,799,452	258,114	274,918	14,113	486,084	57,659	1,101,392	61.21	698,060	483,690	493,975	300,965
	12 mos	1,099	11,921,284	3,045,273	16,232,536	2,791,966	3,510,495	145,867	5,671,120	600,087	12,842,964	79.12	3,389,572	2,532,473	2,600,813	962,088
Fort Worth & Denver City	Dec.	454	843,919	340,705	1,293,165	139,455	227,940	9,105	466,367	40,773	891,824	68.97	401,340	264,774	269,585	245,455
	12 mos.	454	8,333,485	4,082,397	13,143,676	2,027,403	2,877,188	96,794	5,766,548	432,708	11,280,929	85.83	1,862,747	1,480,053	1,102,731	—1,741,855
Wichita Valley	Dec.	256	129,876	45,798	181,885	37,248	15,700	39	85,257	1,901	140,145	77.05	41,740	34,758	20.117	51,325
	12 mos.	256	1,202,742	521,211	1,825,944	438,862	178,481	966	790,954	19,742	1,428,888	78.26	397,056	330,238	145,309	—42,246
Colorado & Wyoming	Dec.	43	36,477	1,178	128,711	12,360	42,584	173	54,519	4,268	113,903	88.50	14,807	8,807	1,168	25,646
	12 mos	43	300,268	12,240	1,084,796	182,559	261,184	3,271	540,805	50,437	1,038,256	95.71	46,540	—14,460	—46,267	—112,620
Columbus & Greenville	Dec.	278	133,537	52,977	198,812	54,412	18,354	—925	99,599	5,927	177,367	89.21	21,445	10,445	—19,791	—39,194
	12 mos.	278	1,106,629	603,123	1,881,559	713,489	300,770	32,597	1,108,608	75,834	2,231,299	122.91	—349,739	—466,956	—754,466	—679,924
Copper Range	Dec.	140	63,094	13,221	82,494	18,674	18,569	1,689	48,922	3,351	91,207	110.56	—8,712	—18,537	9,970	48,211
	12 mos.	142	765,905	138,701	992,414	255,311	195,388	21,884	462,025	33,805	968,413	97.58	24,000	—61,537	—43,823	87,658
Delaware & Hudson	Dec.	881	4,277,052	282,799	4,761,775	422,473	1,219,319	39,760	1,902,684	167,925	3,773,420	79.24	988,355	906,855	932,215	909,859
	12 mos.	881	38,564,897	3,726,458	44,648,193	4,965,047	12,523,068	380,419	21,142,765	1,842,848	41,168,115	92.21	3,480,078	2,509,439	2,318,383	240,236
Delaware, Lackawanna & Western	Dec.	956	6,432,046	1,277,007	8,461,255	649,426	1,714,349	103,802	3,697,690	192,084	6,411,862	75.78	2,049,393	2,194,984	2,146,532	898,149
	12 mos.	956	59,022,994	13,764,997	81,907,747	10,062,953	18,874,595	1,033,506	40,097,103	1,907,048	72,956,432	89.07	8,951,316	4,613,297	4,588,308	—7,359,056
Denver & Salt Lake	Dec.	255	227,391	27,874	265,680	44,069	81,265	743	126,775	7,409	260,261	97.96	5,419	—1,354	—6,874	181,542
	12 mos.	255	2,345,901	458,662	2,938,479	795,502	889,376	13,528	1,496,507	95,052	3,289,966	111.96	—351,486	—451,713	—527,616	423,801
Detroit & Mackinac	Dec.	376	96,551	38,408	146,544	33,221	69,741	2,162	130,821	6,876	242,601	165.55	—96,057	—105,447	—90,383	—33,946
	12 mos.	376	1,473,145	438,714	2,078,602	396,224	590,208	33,003	1,104,129	91,661	2,213,738	106.50	—135,137	—278,329	—152,655	—62,363
Detroit & Toledo Shore Line	Dec.	61	260,619	.....	263,172	20,976	20,575	2,167	79,749	5,352	128,819	48.95	134,353	124,353	83,818	65,687
	12 mos.	61	2,431,052	.....	2,450,010	331,595	273,870	27,976	855,297	68,183	1,556,921	63.55	893,088	775,827	320,098	—589,422
Detroit, Toledo & Ironton	Dec.	454	470,350	19,405	508,666	185,354	244,676	8,908	224,183	20,706	683,736	134.42	—175,071	—184,458	—226,246	—94,842
	12 mos.	454	4,720,655	192,343	5,220,604	1,891,902	1,389,125	84,404	2,699,880	254,963	6,317,189	121.00	—1,096,584	—1,206,750	—1,529,306	—809,718
Duluth & Iron Range	Dec.	291	98,386	32,353	157,726	97,596	123,009	—58	187,521	54,804	462,508	293.24	—304,782	—1,350,052	—1,366,002	—1,221,104
	12 mos.	297	9,912,706	301,591	11,052,317	1,458,038	1,509,620	12,557	3,053,678	270,328	6,311,628	57.11	4,740,689	3,129,449	3,246,566	194,851
Duluth, Missabe & Northern	Dec.	406	165,720	58,103	259,312	302,899	236,710	8,101	287,557	28,181	766,561	295.61	—507,249	—3,373,161	—3,353,891	—2,998,825
	12 mos.	406	17,286,733	623,334	19,614,069	2,611,412	2,127,314	41,316	4,601,181	288,078	9,692,259	49.42	9,921,810	6,042,938	6,062,809	—5,260,921
Duluth, South Shore & Atlantic	Dec.	591	360,601	141,481	535,844	62,078	78,626	5,696	290,261	14,833	461,261	85.60	74,583	49,148	28,428	134,108
	12 mos.	600	3,972,143	1,356,658	5,900,958	1,143,908	1,027,590	64,196	2,990,277	144,925	5,457,264	92.48	44,695	151,999	—93,346	—61,581
Mineral Range	Dec.	101	36,987	433	39,494	10,755	20,410	368	31,385	910	63,827	161.61	—24,334	—31,469	—26,396	15,636
	12 mos.	101	632,216	3,900	663,975	181,150	248,571	3,773	410,374	14,567	858,435	129.29	—194,460	—245,018	—158,138	—48,654
Duluth, Winnipeg & Pacific	Dec.	178	151,807	39,826	213,625	30,630	47,714	6,073	120,677	20,532	225,626	105.62	—12,002	—24,100	—28,928	—69,442
	12 mos.	178	2,065,475	359,785	2,498,223	451,364	515,488	45,082	1,250,626	114,925	2,377,485	95.17	120,738	—13,348	7,903	—131,545
Elgin, Joliet & Eastern	Dec.	837	2,390,707	20	2,651,501	257,140	555,224	16,400	901,860	54,184	1,784,654	67.31	866,847	722,411	527,692	—76,937
	12 mos.	834	22,751,128	131	25,630,441	2,716,195	5,632,477	115,176	9,984,723	473,214	18,911,158	73.78	6,719,283	6,005,632	3,642,405	369,758
El Paso & Southwestern	Dec.	1,027	943,021	256,819	1,269,896	—157,681	231,379	26,279	373,164	56,780	540,295	42.55	729,601	576,147	588,560	471,121
	12 mos.	1,027	10,892,633	2,643,796	14,490,558	2,720,731	2,831,954	238,926	4,066,620	540,351	10,511,729	72.54	3,978,829	2,747,722	2,797,995	—197,615
Erie R. R.	Dec.	1,989	8,300,290	1,278,789	10,118,195	600,917	3,038,647	156,749	5,555,344	348,347	9,753,911	96.40	364,284	2,702	463,358	218,618
	12 mos.	1,989	85,027,457	14,377,211	109,066,950	14,859,638	36,359,674	1,328,655	59,543,296	3,396,292	116,284,948	106.62	—7,217,998	—10,531,612	—9,151,818	—9,855,732
Chicago & Erie	Dec.	269	991,788	84,852	1,116,512	172,156	206,065	22,352	694,675	48,190	1,141,077	102.20	—24,565	6,852	—124,644	31,059
	12 mos.	269	10,889,042	970,368	12,837,811	1,617,753	2,185,184	203,666	6,832,398	446,444	11,307,420	88.08	1,530,391	1,091,999	—2,383,425	—2,572,495

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1920—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
New Jersey & New York	Dec.	47	$19,071	$100,543	$121,616	$7,473	$28,676	$2,568	$77,780	$3,360	$119,856	98.55	$1,760	—$1,294	—$8,362	$9,745
	12 mos.	47	189,709	1,079,491	1,348,224	139,666	226,771	20,099	847,360	32,986	1,266,875	93.97	81,349	50,322	—206,310	—15,854
N. Y., Susquehanna & Western	Dec.	135	173,870	68,688	288,946	82,294	85,125	4,889	303,466	11,505	487,139	168.59	—198,193	—219,543	—208,541	—70,394
	12 mos.	135	3,121,451	785,981	4,450,111	838,240	929,505	41,678	3,308,414	128,999	5,246,540	117.90	—796,428	—1,082,658	—1,035,518	—754,804
Florida East Coast	Dec.	764	789,121	521,707	1,512,559	281,881	283,649	21,572	597,370	30,751	1,235,465	81.68	277,095	193,677	142,994	—106,164
	12 mos.	764	7,682,599	4,032,316	13,546,206	2,147,568	2,469,152	118,024	5,324,492	326,850	10,537,949	77.79	3,008,257	2,406,726	1,947,753	517,218
Fonda, Johnstown & Gloversville	Dec.	88	38,736	79,616	123,057	14,537	11,037	449	49,263	6,866	82,151	66.76	40,905	42,484	45,569	9,632
	12 mos.	88	484,323	886,668	1,431,562	170,210	136,997	6,426	536,407	70,839	920,880	64.33	510,682	456,786	429,714	50,312
Fort Smith & Western	Dec.	253	160,424	36,301	213,008	73,582	47,567	5,584	88,450	8,727	225,536	105.87	—12,528	—18,953	—18,921	—52,494
	12 mos.	253	1,489,787	409,760	2,045,504	479,245	472,829	56,021	841,413	95,119	1,960,726	95.86	84,778	21,523	54,110	—118,113
Galveston Wharf Co	Dec.	13	.....	.....	247,099	58,212	8,456	686	50,817	6,164	156,808	63.46	90,291	66,886	65,716	40,785
	12 mos.	13	.....	.....	1,980,567	571,284	63,180	6,362	537,646	36,684	1,523,693	76.93	456,873	252,755	260,922	293,090
Georgia R. R.	Dec.	328	290,087	160,118	488,921	77,466	101,311	21,652	259,874	21,810	482,105	98.60	6,815	—11,062	—15,060	—19,776
	12 mos.	328	4,283,994	1,798,264	6,579,140	1,063,329	1,391,011	189,258	3,544,823	242,725	6,433,391	97.78	145,749	62,349	—22,014	—1,336,342
Georgia & Florida	Dec.	405	94,399	27,902	131,805	46,190	22,343	7,839	88,997	9,858	175,229	132.95	—43,423	—55,017	—58,688	7,770
	12 mos.	405	1,066,062	327,150	1,528,672	707,994	321,784	74,096	1,057,429	111,219	2,272,525	148.66	—743,852	—826,043	—884,790	—441,792
Great Northern	Dec.	8,170	7,179,512	1,682,516	9,827,634	1,309,161	2,199,619	127,417	4,546,032	256,465	8,547,875	86.98	1,279,758	539,424	530,168	1,373,771
	12 mos.	8,174	88,996,888	20,551,505	124,192,374	25,196,154	26,029,749	1,208,180	53,556,586	2,812,344	110,419,064	88.91	13,773,309	4,075,364	6,283,495	—6,176,123
Gulf Coast Lines	Dec.	920	970,270	283,096	1,323,418	232,563	248,828	31,390	484,212	43,776	1,020,213	76.3	302,205	245,694	188,643	93,814
	12 mos.	920	9,452,775	3,279,934	13,486,789	3,055,240	2,346,942	289,898	4,580,149	506,487	10,746,847	79.6	2,739,942	2,375,711	1,474,088	222,098
Gulf and Ship Island	Dec.	307	175,076	54,704	247,353	63,753	56,854	7,703	110,896	14,509	254,122	102.74	—6,769	—27,454	—26,344	—18,590
	12 mos.	307	2,179,221	620,704	3,053,924	859,770	719,444	76,116	1,303,341	163,518	3,127,559	102.41	—73,634	—341,239	—250,904	—164,476
Gulf, Mobile & Northern	Dec.	470	364,674	65,308	446,986	81,900	78,717	12,632	196,509	19,019	387,416	86.67	59,570	45,887	34,426	64,243
	12 mos.	470	3,215,707	710,651	4,180,494	1,410,344	1,050,442	131,565	1,980,710	199,060	4,770,215	114.11	—589,366	—753,544	—846,183	—737,508
Illinois Central	Dec.	4,799	9,684,363	2,566,316	13,117,546	1,617,541	3,003,266	150,217	6,111,173	293,283	11,255,997	85.81	1,861,549	886,237	943,486	1,004,139
	12 mos.	4,799	106,178,886	27,041,278	145,154,272	25,867,557	37,340,426	1,348,464	64,744,121	3,446,483	133,787,561	92.17	11,366,711	3,328,619	6,914,198	2,722,402
Yazoo & Mississippi Valley	Dec.	1,381	1,443,595	524,908	2,082,524	358,857	379,192	29,039	968,606	67,663	1,807,928	86.81	274,597	29,262	21,845	10,561
	12 mos.	1,381	20,600,911	5,906,989	28,124,175	6,300,043	6,339,341	324,347	11,864,405	784,530	25,666,550	91.26	2,457,625	1,254,176	—378,631	—4,826,115
Illinois Terminal	Dec.	699	112,464	.....	115,613	14,703	9,249	977	30,497	11,566	66,988	57.94	48,625	47,507	16,906	—39,479
	12 mos.	19,625	1,069,694	.....	1,119,932	79,186	121,316	9,633	273,737	69,450	553,317	49.41	566,615	553,039	474,339	—55,298
International & Great Northern	Dec.	1,159	1,525,612	402,674	2,087,977	284,697	413,780	26,862	974,437	57,014	1,760,860	84.33	327,116	296,918	190,141	440,963
	12 mo.	1,159	14,466,681	3,878,822	19,998,851	3,778,485	4,651,173	265,543	10,058,811	615,899	19,457,485	97.29	541,366	171,168	—718,533	694,612
Kansas City, Mexico & Orient	Dec.	272	129,201	19,019	163,459	34,883	96,365	5,161	72,251	—8,465	200,194	122.47	—36,735	—47,624	—43,341	29,366
	12 mos.	272	1,374,374	220,459	1,714,314	576,250	636,740	48,458	970,906	122,302	2,354,656	137.35	—640,342	—735,995	—727,701	—174,564
Kan. City, Mex. & Orient of Tex.	Dec.	465	204,197	26,973	247,028	36,917	46,785	5,237	103,552	7,100	199,591	80.80	47,437	50,033	50,061	105,895
	12 mos.	465	1,580,222	282,228	1,991,520	765,053	532,744	48,657	1,113,106	98,329	2,557,890	128.44	—566,370	—633,696	—629,036	64,406
Kansas City Southern	Dec.	779	1,433,028	248,386	1,810,488	189,142	306,411	44,241	748,279	88,916	1,375,537	75.98	434,951	361,277	315,920	—10,907
	12 mos.	779	15,258,197	2,968,057	19,762,433	2,697,525	3,980,965	423,248	8,259,393	812,033	16,160,168	81.77	3,602,265	2,762,286	2,268,133	350,755
Texarkana & Ft. Smith	Dec.	93	199,634	23,768	237,267	21,583	24,900	6,538	77,102	8,996	139,237	58.68	98,030	89,960	58,966	89,440
	12 mos.	93	1,800,371	275,471	2,251,813	265,933	243,200	38,025	767,004	82,505	1,397,722	62.07	854,091	732,939	498,174	245,851
Kansas City Terminal	Dec.	27	.....	.....	131,270	18,383	26,062	.....	67,569	2,600	116,619	88.84	14,650	3,559	164,356	—40,792
	12 mos.	27	.....	.....	1,598,277	282,523	378,290	.....	887,351	34,480	1,611,492	100.83	—13,215	—326,409	2,122,111	—265,446
Kansas, Oklahoma & Gulf	Dec.	329	275,794	29,025	314,847	60,745	63,672	3,908	135,134	15,033	278,777	88.55	36,070	21,375	1,293	119,068
	12 mos.	329	2,366,309	307,628	2,803,056	652,321	706,486	33,665	1,365,935	128,254	2,889,046	103.07	—85,990	—210,451	—323,237	718,711
Lake Superior & Ishpeming	Dec.	34	9,087	358	11,460	17,880	19,794	227	14,748	1,112	53,760	469.11	—42,301	—234,160	—231,269	—187,107
	12 mos.	34	1,468,266	2,860	1,658,345	242,195	224,705	2,870	416,738	36,235	922,743	55.64	735,502	489,893	510,970	230,270
Lake Terminal R. R.	Dec.	12	.....	160	168,911	15,232	28,836	.....	100,531	177	144,775	85.71	24,136	15,814	6,689	5,567
	12 mos.	12	.....	2,332	1,449,021	203,231	322,194	.....	1,032,080	1,097	1,558,602	107.56	—109,581	—182,222	—288,228	—139,512
Lehigh & Hudson River	Dec.	96	302,597	6,070	315,335	35,632	54,178	2,139	123,692	9,644	225,286	71.44	90,049	81,419	47,320	—42,241
	12 mos.	96	2,955,332	52,248	3,116,401	394,324	597,599	22,830	1,623,855	96,647	2,735,255	87.77	381,146	277,536	—38,306	—429,965
Lehigh & New England	Dec.	237	498,221	2,124	516,992	37,803	99,886	2,053	176,461	15,985	332,130	64.24	184,862	128,284	155,100	84,881
	12 mos.	236	4,601,752	23,848	4,808,056	792,081	1,012,002	61,240	1,801,422	170,664	3,834,961	79.76	973,094	758,319	985,494	73,519
Lehigh Valley	Dec.	1,437	6,123,686	690,001	7,312,152	884,374	2,432,863	93,287	3,539,889	223,597	7,199,961	98.47	112,191	—106,192	52,996	—45,950
	12 mos.	1,435	61,684,268	7,823,747	75,097,761	11,932,837	22,949,796	897,415	40,825,222	1,763,479	78,695,005	104.79	—3,597,244	—6,077,686	—5,456,881	—9,135,981
Los Angeles & Salt Lake	Dec.	1,168	1,267,081	662,489	2,150,265	308,623	418,568	45,893	763,041	40,060	1,634,395	76.01	515,870	421,425	371,556	33,649
	12 mos.	1,168	13,033,896	5,935,767	20,898,126	2,891,494	4,024,131	390,039	7,537,077	462,494	15,988,561	76.51	4,909,565	3,811,371	3,584,869	208,306
Louisiana & Arkansas	Dec.	302	347,522	49,125	404,952	75,960	68,520	5,015	150,137	9,520	309,234	76.36	95,718	60,603	47,938	—5,700
	12 mos.	302	3,555,039	591,181	4,305,421	970,880	634,127	59,466	1,528,563	105,196	3,297,754	76.60	1,007,667	786,484	688,084	839,149
Louisiana Ry. & Nav. Co	Dec.	343	283,194	50,585	357,703	97,866	80,711	12,280	208,179	12,859	411,896	115.15	—54,193	—96,803	—136,894	—172,489
	12 mos.	343	3,489,795	522,769	4,275,834	1,040,834	729,106	89,881	2,012,818	139,673	4,012,312	93.84	263,523	62,791	—219,216	—151,973
Louisville & Nashville	Dec.	5,040	8,004,246	2,483,326	11,254,142	1,648,851	3,255,172	217,849	4,924,489	278,096	10,380,911	92.24	873,231	497,369	423,220	—1,676,712
	12 mos.	5,040	90,686,170	26,725,621	126,371,694	22,607,961	34,750,294	2,108,749	58,282,656	3,045,952	121,395,811	96.06	4,975,883	1,324,557	3,321,221	—8,470,624

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1920—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
Louisville, Henderson & St. Louis	Dec.	199	$190,580	$80,334	$282,429	$66,644	$84,054	$7,584	$170,991	$9,751	$339,023	120.04	—$56,594	—$76,302	—$105,585	—$144,637
	12 mos.	199	2,155,604	789,846	3,163,649	779,336	489,439	71,718	1,258,497	109,080	2,708,070	85.60	455,579	383,954	231,809	—260,053
Maine Central	Dec.	1,216	1,335,555	451,593	1,925,933	383,450	477,671	14,562	1,221,895	64,612	2,165,422	112.44	—239,489	—342,492	—343,782	—323,709
	12 mos.	1,216	14,303,426	5,415,081	21,366,538	4,047,488	4,954,149	169,504	12,572,582	604,367	22,393,901	104.81	—1,027,364	—2,165,595	—2,340,031	—1,108,604
Midland Valley	Dec.	388	368,221	112,440	500,187	115,919	66,320	5,431	179,929	14,900	382,500	76.47	117,687	95,489	85,688	117,128
	12 mos.	388	3,600,444	1,263,269	5,086,398	1,227,701	839,614	45,667	1,874,473	202,072	4,189,527	82.37	896,871	795,182	750,886	411,949
Minneapolis & St. Louis	Dec.	1,646	1,234,412	233,079	1,568,057	175,141	381,428	25,707	785,420	46,206	1,414,200	90.19	153,857	89,386	89,231	518,199
	12 mos.	1,646	13,230,137	2,704,731	17,004,330	3,242,944	4,343,040	248,767	8,926,696	495,399	17,257,834	101.49	—253,504	—984,319	—919,339	—592,327
Minneapolis, St. P. & S. S. Marie	Dec.	4,243	2,807,116	772,743	3,853,423	547,133	1,108,326	88,384	2,062,629	61,641	3,890,696	100.97	—38,273	—379,625	—490,943	762,920
	12 mos.	4,243	34,798,835	9,117,847	48,157,646	8,863,548	10,209,973	550,242	22,321,150	1,208,321	43,513,033	90.35	4,644,614	1,181,529	1,112,831	—3,890,623
Mississippi Central	Dec.	164	51,626	19,668	74,987	23,307	29,966	2,656	42,275	8,195	106,400	141.89	—31,413	—51,521	—41,668	13,254
	12 mos.	164	723,751	271,240	1,069,815	403,925	400,309	29,411	530,914	102,740	1,467,299	137.15	—397,484	—468,033	—332,289	—144,726
Missouri & North Arkansas	Dec.	364	142,100	50,847	205,071	57,790	37,691	4,561	83,150	9,422	192,454	93.85	12,617	8,235	9,088	61,344
	12 mos.	364	1,321,806	602,973	2,115,211	714,653	443,226	42,820	948,101	104,818	2,252,738	106.50	—137,526	—193,705	—256,059	409,119
Missouri, Kansas & Texas of Tex	Dec.	1,739	1,812,107	847,800	2,886,064	605,349	525,120	48,191	1,215,162	97,925	2,508,584	86.92	377,480	362,872	6,093	1,153,022
	12 mos.	1,749	17,829,912	9,461,004	29,929,948	7,446,628	5,735,438	431,128	15,061,855	1,098,052	30,045,157	100.38	—115,209	—721,681	—4,310,895	—1,887,258
Missouri, Kansas & Texas	Dec.	1,715	2,293,504	820,577	3,439,476	522,702	883,616	56,360	1,210,568	109,768	2,797,987	81.34	641,489	556,651	717,382	299,250
	12 mos.	1,715	27,515,072	8,948,290	39,925,436	7,318,606	10,850,749	490,998	14,384,487	1,346,970	34,590,192	86.64	5,335,244	3,969,250	5,872,527	1,341,380
Wichita Falls & Northwestern	Dec.	328	136,129	42,510	189,415	30,961	28,903	1,232	90,143	8,766	160,005	84.47	29,410	19,494	—443	135,382
	12 mos.	328	1,835,003	598,221	2,609,814	715,045	397,194	12,718	1,315,582	126,514	2,566,937	98.36	42,877	—88,005	—390,344	11,821
Missouri Pacific	Dec.	7,300	7,862,070	2,013,808	10,694,687	1,396,078	2,231,452	164,603	4,862,040	279,321	8,961,804	83.80	1,732,884	1,670,738	1,354,844	1,675,880
	12 mos.	7,299	85,864,027	21,989,812	118,132,429	24,519,490	28,976,372	1,812,009	51,601,462	3,228,318	110,687,365	93.70	7,445,064	3,352,740	—1,090,486	—5,492,959
Monongahela	Dec.	106	644,036	43,489	694,800	81,827	64,456	2,100	171,359	7,532	327,275	47.10	367,525	345,921	198,339	199,362
	12 mos.	107	4,216,858	360,252	4,674,852	1,361,384	711,500	13,903	1,580,476	96,294	3,763,557	80.51	911,295	825,346	—33,542	—1,062,593
Monongahela Connecting	Dec.	7	.....	.....	139,935	24,448	30,766	561	78,565	7,285	140,625	100.49	—689	50,086	40,184	—9,488
	12 mos.	7	.....	.....	2,944,586	347,803	450,174	6,765	1,481,057	80,026	2,365,825	80.35	578,761	480,183	399,216	406,376
Montour	Dec.	56	158,431	1,376	163,331	37,857	74,407	974	53,114	7,658	174,055	106.57	—10,723	—11,442	31,470	29,964
	12 mos.	56	1,615,032	15,017	1,677,352	406,055	682,965	13,434	505,045	88,404	1,713,156	102.13	—35,805	—63,779	382,673	231,247
Nashville, Chattanooga & St. Louis	Dec.	1,247	1,352,772	526,312	2,001,850	333,397	474,514	63,050	1,041,161	63,752	1,985,495	99.18	16,355	—58,651	14,671	—63,344
	12 mos.	1,247	16,907,479	5,598,821	24,481,590	5,006,720	6,568,222	707,196	11,395,854	691,206	24,450,528	99.87	31,062	—570,520	19,256	—1,040,788
Nevada Northern	Dec.	164	61,987	8,671	76,942	14,238	12,798	1,026	24,780	6,361	59,306	77.08	17,636	7,760	10,283	—4,005
	12 mos.	165	1,391,160	122,796	1,588,639	324,942	260,877	10,242	426,335	58,422	1,081,950	68.11	506,688	385,370	367,759	123,658
Newburgh & South Shore	Dec.	7	.....	.....	234,420	31,345	52,135	.....	101,351	5,581	190,412	81.23	44,007	17,689	17,983	—12,076
	12 mos.	7	.....	.....	1,920,237	221,491	427,019	.....	1,144,682	54,227	1,847,420	96.21	72,817	—52,016	—212,290	—76,403
New Orleans Great Northern	Dec.	284	148,030	48,403	206,961	46,868	72,721	5,770	162,882	12,105	300,947	145.41	—93,986	—106,356	—102,374	—89,394
	12 mos.	284	1,950,218	613,700	2,684,965	620,644	622,251	57,685	1,231,913	128,464	2,666,932	99.33	18,034	—126,666	—14,092	—28,256
New York Central	Dec.	.....	19,540,141	8,238,538	31,006,194	3,327,038	8,369,254	405,338	16,431,533	950,774	29,859,393	.....	1,146,801	—831,375	—825,951	—5,136,758
	12 mos.	.....	223,518,287	96,487,502	368,355,217	52,691,698	98,810,614	3,541,766	178,315,753	9,526,188	348,578,085	.....	19,827,132	6,111,625	3,557,580	—46,147,051
Cincinnati Northern	Dec.	245	240,550	20,975	273,270	39,425	66,767	5,629	158,880	8,315	278,857	102.04	—5,586	—47,482	—43,112	—106,832
	12 mos.	245	3,225,456	243,411	3,616,989	652,890	771,560	49,184	1,398,288	80,529	2,952,214	81.62	664,775	498,890	357,341	—133,510
Indiana Harbor Belt	Dec.	120	.....	.....	770,191	108,861	191,309	3,986	573,775	38,911	916,837	119.04	—146,646	—157,333	—158,359	100,008
	12 mos.	120	.....	.....	9,216,137	1,363,140	3,037,306	37,377	6,517,058	285,601	11,240,346	121.96	—2,024,209	—2,152,741	—3,360,036	—2,199,509
Kanawha & Michigan	Dec.	176	373,044	74,323	465,926	94,183	154,830	4,130	183,642	16,293	441,380	94.73	24,546	—45,157	47,823	60,955
	12 mos.	176	4,516,058	686,309	5,417,655	1,060,074	1,951,215	45,081	2,079,241	172,233	5,296,148	97.76	121,506	—286,636	676,139	509,296
Lake Erie & Western	Dec.	738	876,195	78,841	1,015,882	119,411	325,262	21,811	456,075	32,906	955,276	94.03	60,605	30,870	33,886	141,814
	12 mos.	738	10,228,360	819,044	11,712,561	1,563,998	3,938,412	199,006	5,139,551	336,294	11,169,418	95.36	543,143	50,146	—126,216	80,293
Michigan Central	Dec.	1,865	4,163,992	2,336,622	7,130,933	896,410	1,727,231	108,191	3,174,270	171,724	6,163,143	86.43	967,790	477,824	284,206	—909,470
	12 mos.	1,865	55,529,156	23,038,492	87,555,082	12,349,736	22,878,112	1,035,855	37,574,431	1,728,111	76,822,543	87.74	10,732,539	7,825,827	4,668,280	—12,265,892
Pittsburgh & Lake Erie	Dec.	224	3,087,225	322,776	3,548,712	547,652	1,027,117	21,500	1,365,746	76,707	3,042,466	85.73	506,245	—327,237	—169,229	—720,610
	12 mos.	224	29,272,496	3,335,859	35,570,807	6,417,788	12,426,181	244,047	13,299,821	778,734	33,193,864	93.32	2,376,942	—74,355	2,361,577	—1,172,810
Toledo & Ohio Central	Dec.	503	1,205,767	82,239	1,352,688	126,157	271,427	11,597	596,983	28,751	1,038,300	76.76	314,388	146,833	216,686	455,128
	12 mos.	492	11,851,618	874,263	13,445,864	1,875,428	3,696,901	126,875	5,946,540	288,552	11,975,713	89.07	1,470,150	839,071	1,278,202	1,395,852
New York, Chicago & St. Louis	Dec.	574	2,344,228	120,708	2,530,158	418,463	666,653	61,260	1,328,134	98,605	2,575,999	101.81	—45,841	—180,845	—243,298	—444,631
	12 mos.	574	25,947,197	1,319,111	28,225,188	3,443,277	5,394,768	572,282	12,234,162	879,489	22,590,279	80.04	5,634,909	4,488,270	4,219,408	169,599
N. Y., New Haven & Hartford	Dec.	2,002	4,936,765	4,550,980	10,784,088	1,477,037	2,470,241	72,772	5,904,049	394,849	10,520,572	97.56	263,516	—174,837	—515,714	—863,495
	12 mos.	1,986	57,059,805	52,343,411	125,447,048	20,605,113	30,142,849	708,109	66,682,480	4,304,413	124,767,091	99.46	679,958	—4,006,319	—9,964,046	—16,684,375
Central New England	Dec.	301	835,295	29,690	907,986	136,336	152,158	4,871	279,342	16,656	584,938	64.42	323,048	305,345	185,210	367,953
	12 mos.	301	7,122,950	320,648	7,787,075	1,916,452	1,726,632	46,293	4,312,117	200,577	8,207,465	105.40	—420,389	—638,045	—1,892,243	—1,722,556
New York, Ontario & Western	Dec.	569	834,515	152,344	1,140,017	93,419	304,216	12,898	597,110	34,699	1,042,342	91.43	97,675	47,675	55,775	153,306
	12 mos.	569	7,886,917	3,099,855	12,924,935	2,186,883	3,378,322	144,077	6,330,631	339,473	12,379,386	95.78	545,548	136,063	56,929	—726,801
Norfolk & Western	Dec.	2,198	7,053,486	1,069,177	8,451,199	947,770	2,604,758	77,018	3,665,089	176,359	7,469,543	88.38	981,656	1,011,631	1,317,572	950,451
	12 mos.	2,200	71,931,066	10,376,173	86,559,174	12,803,469	29,423,145	752,038	38,708,851	1,889,210	83,797,472	96.81	2,761,703	—1,381,287	2,839,759	—7,523,646

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1920—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
Norfolk Southern	Dec.	944	$410,680	$170,381	$637,040	$43,759	$213,254	$23,287	$363,512	$34,619	$678,724	106.54	—$41,684	—$67,802	—$68,607	$208,260
	12 mos.	928	5,216,819	2,024,370	7,816,473	1,593,252	1,687,142	195,992	4,200,728	374,114	8,054,063	103.04	—237,590	—489,877	—570,725	—727,382
Northern Pacific	Dec.	6,655	6,765,971	1,622,954	9,159,871	954,258	2,179,123	116,177	3,900,720	288,932	7,575,178	82.70	1,584,693	779,304	1,144,952	—48,610
	12 mos.	6,653	79,214,597	21,127,646	111,166,286	20,637,854	24,701,066	1,121,754	46,941,600	3,039,730	98,095,059	88.24	13,071,227	3,545,640	8,636,686	—9,742,676
Minnesota & International	Dec.	194	78,288	41,193	125,512	12,392	36,693	672	59,157	4,262	116,176	92.56	9,336	2,062	—11,290	—20,843
	12 mos.	194	818,645	390,068	1,303,979	307,232	270,053	7,174	650,450	48,234	1,283,140	98.40	20,839	—49,789	—175,931	—132,238
Northwestern Pacific	Dec.	534	251,519	206,461	528,863	145,339	122,060	5,475	283,053	17,606	575,181	108.76	—46,316	—70,327	—73,773	—118,823
	12 mos.	537	4,147,406	2,795,363	7,867,940	1,547,957	1,126,625	74,594	3,385,372	193,171	6,361,068	80.85	1,506,872	1,169,560	1,040,335	—109,936
Pennsylvania R. R.	Dec.	7,359	36,955,352	11,384,521	52,596,067	4,206,339	16,020,028	504,806	27,340,429	1,347,937	50,325,488	95.68	2,270,578	845,645	—307,522	—3,170,642
	12 mos.	7,359	384,372,253	133,241,548	566,860,758	89,190,602	177,897,960	5,046,929	292,230,168	14,617,083	590,049,937	104.09	—23,189,178	—41,782,742	—48,229,428	—62,138,091
Baltimore, Chesapeake & Atlantic	Dec.	87	88,790	40,323	133,629	13,347	23,640	1,821	84,894	5,495	129,198	96.68	4,431	4,902	7,466	16,166
	12 mos.	87	1,061,976	520,645	1,675,099	173,937	486,994	16,815	1,064,288	52,578	1,794,611	107.14	—119,512	—151,641	—134,832	108,721
Cincinnati, Lebanon & Northern	Dec.	76	201,437	6,170	206,301	13,011	17,460	1,834	76,807	3,026	112,129	54.35	94,172	78,381	78,801	139,999
	12 mos.	76	1,215,444	104,907	1,392,359	268,278	260,869	23,077	865,269	33,408	1,450,893	104.20	—58,533	—144,374	—133,921	76,699
Long Island	Dec.	398	637,167	1,103,898	1,934,835	240,924	495,949	23,597	1,301,781	71,139	2,153,111	111.28	—218,276	—325,294	—339,502	—125,893
	12 mos.	398	7,267,266	15,956,228	25,843,749	3,787,158	5,501,296	226,053	14,756,284	736,742	25,211,837	97.56	631,911	—604,371	—998,855	—3,420,554
Maryland, Delaware & Virginia	Dec.	82	73,752	31,250	108,018	17,068	12,156	1,045	84,278	3,278	117,958	109.20	—9,940	—11,249	—15,728	3,602
	12 mos.	82	826,773	457,629	1,338,996	144,201	397,643	11,459	946,316	33,645	1,533,263	114.51	—194,267	—211,631	—254,903	163,634
New York, Phila. & Norfolk	Dec.	121	227,940	157,372	484,566	82,463	230,794	9,970	358,586	17,603	719,396	148.46	—234,830	—224,198	—247,912	147,301
	12 mos.	121	5,865,019	1,330,344	7,911,392	852,915	2,315,291	116,710	4,738,484	195,275	8,428,187	106.53	—516,795	—841,919	—1,006,577	—1,647,205
West Jersey & Seashore	Dec.	359	386,870	426,059	878,236	188,428	236,165	14,847	583,107	27,830	1,060,647	120.77	—182,411	—227,658	—246,071	—2,414
	12 mos.	359	4,606,026	8,316,106	13,914,442	3,062,907	3,035,466	139,567	7,333,856	322,647	13,999,620	100.61	—85,177	—648,766	—1,030,463	1,025,067
Peoria & Pekin Union	Dec.	19	23,181	3,794	182,298	20,772	31,189	43	114,083	7,001	173,090	94.95	9,209	—7,947	14,349	13,792
	12 mos.	19	328,934	49,539	1,679,044	260,942	443,531	2,157	1,139,271	63,968	1,909,869	113.75	—230,825	—352,481	—217,359	121,240
Pere Marquette	Dec.	2,238	2,341,117	553,149	3,101,663	141,483	737,918	70,532	1,653,061	132,223	2,736,098	88.21	365,565	268,713	203,928	120,604
	12 mos.	2,234	29,937,859	6,939,594	40,722,368	5,272,263	9,486,904	547,321	19,133,670	1,364,739	35,842,538	88.02	4,879,830	4,010,563	1,746,877	—4,933,481
Phil., Bethlehem & New Eng	Dec.	10	.....	.....	80,273	9,602	13,577	384	51,472	1,184	76,219	94.95	4,055	—4,724	—7,258	—1,751
	12 mos.	10	.....	....	1,295,245	184,378	181,256	5,250	914,463	18,158	1,303,506	100.64	—8,260	—32,104	—71,793	—52,606
Philadelphia & Reading	Dec.	1,126	8,123,332	1,154,277	9,670,580	581,547	3,061,484	67,881	4,809,728	197,171	8,750,235	90.48	920,344	652,166	176,751	—87,527
	12 mos.	1,126	77,679,510	11,399,500	94,321,558	10,701,222	26,591,373	702,743	47,399,978	2,099,501	87,787,073	93.07	6,534,484	4,121,758	673,703	—2,409,577
Atlantic City	Dec.	177	98,549	137,125	243,814	64,611	41,041	2,991	260,934	6,469	375,874	154.16	—132,060	—147,810	—172,670	—120,381
	12 mos.	177	1,346,183	3,104,574	4,667,231	773,004	564,188	34,838	2,766,274	22,520	4,161,393	89.16	505,838	325,669	27,859	—717,792
Perkiomen	Dec.	41	111,844	8,810	124,324	6,371	5,172	19	46,394	385	58,351	46.94	65,973	61,509	54,868	—1,220
	12 mos.	41	1,078,708	129,440	1,269,616	112,068	57,700	230	506,697	4,177	681,072	53.64	588,545	557,891	491,392	—32,028
Port Reading	Dec.	21	203,776	.....	271,300	14,837	5,009	18	105,043	5,095	130,002	47.92	141,297	129,200	52,557	149,833
	12 mos.	21	1,473,819	.....	1,949,198	206,201	117,670	224	1,078,216	17,113	1,419,424	72.82	529,774	421,580	—248,319	—784,617
Pittsburgh & Shawmut	Dec.	103	211,641	9,418	223,565	3,999	45,988	1,424	67,787	7,339	126,540	56.60	97,025	94,335	121,617	119,847
	12 mos.	103	1,771,538	67,341	1,858,382	338,056	450,782	18,095	665,879	85,245	1,558,058	68.38	300,324	288,947	728,077	907,306
Pittsburgh & West Virginia	Dec.	63	231,798	14,252	284,531	34,356	73,941	2,511	110,031	19,403	266,975	93.83	17,556	—12,255	—25,136	37,941
	12 mos.	63	2,151,602	129,319	2,577,076	789,374	642,365	20,912	968,653	120,592	2,693,295	104.51	—116,219	—300,245	—257,051	398,314
Quincy, Omaha & Kansas City	Dec.	255	88,674	29,288	125,875	32,071	33,180	1,155	119,922	3,107	189,012	150.16	—63,137	—67,390	—72,953	—37,841
	12 mos.	255	913,092	317,190	1,366,998	513,936	332,835	7,938	834,032	29,941	1,717,421	125.64	—350,423	—399,205	—456,962	—248,286
Rich., Fredericksburg & Potomac	Dec.	117	455,095	404,911	1,036,048	115,381	155,767	8,811	578,430	28,827	893,531	86.25	142,517	21,658	—34,569	—252,756
	12 mos.	117	5,239,368	3,883,018	11,049,884	1,209,078	1,838,339	89,887	4,815,523	334,211	8,424,295	76.24	2,625,589	2,174,290	1,789,350	—2,836,565
Rutland	Dec.	415	301,539	149,872	534,122	77,714	108,548	8,233	273,553	18,524	488,537	91.47	45,585	5,248	34,087	29,212
	12 mos.	415	3,268,656	1,631,228	5,966,142	1,137,017	1,615,070	75,950	2,999,151	181,129	6,031,927	101.10	—65,785	—319,815	—91,727	—307,730
St. Louis-San Francisco	Dec.	4,760	5,727,836	2,187,981	8,595,744	1,020,533	2,116,822	94,668	3,459,051	206,643	6,870,564	79.93	1,725,180	1,355,563	1,278,921	325,979
	12 mos.	4,757	63,300,004	25,128,681	94,026,013	15,898,337	21,660,765	868,703	38,789,477	2,807,551	79,768,396	84.84	14,257,617	11,123,916	9,721,129	—4,889,253
Fort Worth & Rio Grande	Dec.	235	83,387	66,516	161,751	104,008	45,497	4,714	194,533	9,247	357,510	221.03	—195,758	—198,621	—211,727	—197,412
	12 mos.	235	1,028,485	286,749	1,961,143	1,115,021	401,917	30,194	1,229,471	85,906	2,861,982	145.94	—900,838	—946,503	—1,191,421	—1,209,861
St. Louis Southwestern	Dec.	968	1,592,319	209,898	1,835,675	189,464	233,437	49,999	494,386	66,483	1,043,382	56.84	792,293	636,921	616,849	155,271
	12 mos.	963	18,003,332	2,351,117	21,311,705	3,074,953	3,519,592	531,135	5,655,469	643,810	13,513,317	63.41	7,798,389	6,896,366	7,056,457	3,978,649
St. Louis Southern of Texas	Dec.	807	646,846	143,766	840,165	214,437	246,159	23,097	400,019	47,594	929,970	110.65	—89,805	—136,499	—104,907	76,820
	12 mos.	807	6,804,549	1,704,553	9,267,393	3,027,598	2,916,518	217,355	4,854,340	402,483	11,410,214	123.12	—2,142,821	—2,431,511	—1,957,905	—449,597
San Antonio & Aransas Pass	Dec.	736	409,923	115,040	562,605	146,964	126,944	11,191	300,515	26,278	611,678	108.72	—49,072	—61,794	—43,313	111,947
	12 mos.	736	4,162,180	1,416,365	6,041,298	1,346,451	1,342,500	98,971	2,964,403	260,084	6,009,095	99.47	32,203	—128,225	—54,407	1,116,223
San Antonio, Uvalde & Gulf	Dec.	317	49,944	23,405	82,594	35,583	24,357	2,939	54,138	7,662	124,681	150.96	—42,086	—42,518	—57,096	—1,194
	12 mos.	317	884,083	480,748	1,462,457	403,228	296,977	28,310	816,933	76,010	1,621,458	110.87	—159,001	—190,823	—324,259	—45,239
Seaboard Air Line	Dec.	3,563	2,820,469	1,258,439	4,557,860	449,786	656,670	94,588	2,206,255	138,460	3,586,364	78.69	971,496	843,733	714,391	894,814
	12 mos.	3,563	32,474,203	11,015,200	49,263,645	8,240,465	11,466,591	1,247,176	25,138,467	1,932,744	48,500,773	98.45	762,873	—932,263	—2,639,545	—4,491,844
South Buffalo	Dec.	11	66,457	.....	138,186	6,273	12,707	444	87,538	4,564	111,527	80.71	26,659	18,866	12,629	39,707
	12 mos.	11	796,458	.....	1,590,382	79,773	199,717	5,742	1,083,768	26,662	1,395,662	87.76	194,720	143,677	—22,530	—8,921
Southern Ry.	Dec.	6,971	7,777,899	3,494,138	12,579,431	2,130,055	2,766,970	225,160	6,078,504	388,701	11,710,920	93.10	868,510	763,385	723,089	—975,407
	12 mos.	6,973	99,408,277	37,239,980	151,864,389	21,843,946	29,757,292	2,157,727	69,565,997	4,059,607	128,865,449	84.86	22,998,941	18,282,015	15,325,801	4,714,191
Alabama Great Southern	Dec.	313	713,909	230,757	1,045,013	42,195	276,499	25,365	416,789	33,339	803,821	76.85	241,191	226,033	209,028	16,774
	12 mos.	313	8,236,856	2,501,211	11,588,804	1,315,991	2,574,168	235,289	4,545,519	300,471	9,066,158	78.23	2,522,647	2,049,581	2,196,256	706,478
Cin., New Orleans & Tex. Pacific	Dec.	338	1,162,065	461,528	1,741,788	162,961	618,957	33,352	735,303	51,082	1,617,072	92.84	124,656	108,235	204,593	348,041
	12 mos.	338	15,071,456	4,354,644	20,858,559	2,348,869	5,535,917	329,151	7,720,481	485,035	16,561,021	79.40	4,297,538	3,353,636	4,126,082	3,606,838
Georgia Southern & Florida	Dec.	402	258,436	135,265	463,159	82,027	96,100	8,017	237,759	10,626	438,162	94.61	24,997	48,490	31,847	8,549
	12 mos.	402	3,239,620	1,511,486	5,330,811	925,323	1,300,445	94,574	2,847,101	152,619	5,349,768	100.35	—18,957	—214,881	—236,445	—294,730

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1920—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Increase (or decr.) comp. with last year.
Mobile & Ohio	Dec.	1,165	$1,281,360	$212,541	$1,589,053	$262,909	$577,623	$44,273	$825,936	$56,378	$1,767,926	111.26	—$178,893	—$243,896	—$190,234	—$142,176
	12 mos.	1,128	15,088,362	2,404,392	18,796,153	3,673,004	6,025,990	422,868	9,127,377	612,148	19,872,796	105.73	—1,076,643	—1,779,134	—1,101,062	—49,519
New Orleans & Northeastern	Dec.	207	478,231	129,286	661,428	66,942	158,943	14,284	398,820	14,413	658,661	99.58	2,767	—68,658	—73,833	35,106
	12 mos.	207	5,597,589	1,327,662	7,728,115	1,240,655	1,595,929	135,571	3,349,268	213,252	6,597,394	85.37	1,130,721	605,453	614,667	432,836
Northern Alabama	Dec.	110	97,357	18,652	119,217	9,692	7,610	2,638	65,262	3,031	88,233	74.01	30,984	31,680	3,503	12,418
	12 mos.	110	1,247,786	192,497	1,501,882	360,774	90,475	20,975	723,161	36,191	1,231,577	82.00	270,305	220,695	—79,386	—140,788
Southern Pacific	Dec.	7,118	10,335,361	5,037,018	17,148,336	1,931,810	2,997,416	199,031	7,218,664	461,331	13,147,999	76.67	4,000,336	3,097,927	3,120,594	1,002,838
	12 mos.	7,101	126,072,242	55,017,100	201,894,192	29,908,028	40,276,068	2,180,984	80,782,578	5,143,046	162,589,592	80.53	39,304,600	28,114,127	27,107,232	—5,453,476
Arizona Eastern	Dec.	382	228,992	52,841	295,733	11,752	61,167	3,138	147,235	23,227	252,888	85.50	42,846	21,560	2,932	—56,452
	12 mos.	380	3,091,401	661,958	4,091,005	855,742	596,833	4,899	1,430,807	256,948	3,232,581	79.02	858,423	513,882	369,014	—214,481
Sou. Pac. Atlantic Steamship Lines	Dec.	...	771,734	56,518	872,859	14,813	199,025	16,529	751,382	38,024	1,019,773	116.83	—146,914	—158,661	—157,217	—115,586
	12 mos.	...	6,444,357	467,870	7,238,800	138,278	3,370,135	175,752	8,087,818	349,798	12,121,781	167.46	—4,882,981	—5,019,587	—4,982,372	—6,332,450
Galv., Harris. & San Antonio	Dec.	1,381	1,796,236	551,696	2,560,922	347,780	10,398	38,718	998,951	79,507	1,493,246	58.31	1,067,677	1,267,901	1,085,686	583,237
	12 mos.	1,383	18,855,650	5,787,177	26,543,747	5,299,132	6,389,687	447,891	10,273,429	878,895	23,559,199	88.76	2,984,548	2,329,796	853,401	—3,164,783
Houston & Texas Central	Dec.	915	867,346	304,920	1,257,899	741,397	—22,469	22,891	410,671	38,112	1,190,383	94.63	67,516	79,678	42,020	—136,713
	12 mos.	900	8,062,291	3,094,995	12,134,259	3,492,397	2,409,983	205,282	4,993,630	347,991	11,447,419	94.34	686,840	142,435	—163,579	—1,680,234
Houston, East & West Texas	Dec.	190	209,374	62,651	286,797	323,120	—35,839	3,169	180,568	8,454	479,471	167.18	—192,674	—203,529	—224,661	—249,642
	12 mos.	190	2,143,653	682,804	3,022,714	1,295,096	435,045	38,614	1,484,208	83,988	3,336,963	110.39	—314,249	—42,267	—577,921	—926,965
Louisiana Western	Dec.	207	320,746	131,854	492,080	202,466	25,877	11,502	186,216	18,540	448,801	91.21	43,279	34,427	24,282	—98,846
	12 mos.	207	3,649,678	1,366,118	5,380,826	1,392,442	945,785	99,226	1,512,481	188,441	4,173,201	77.56	1,207,626	817,072	720,520	—564,956
Morgan's L. & T. R. R. & S. S. Co.	Dec.	400	715,504	209,615	1,004,693	452,777	165,541	16,988	442,644	33,139	1,117,450	111.22	—112,757	—210,902	—274,693	—586,799
	12 mos.	400	7,428,588	2,214,776	10,429,501	2,392,493	2,313,473	158,048	3,973,242	342,897	9,220,206	88.41	1,209,295	541,584	208,373	—903,752
Texas & New Orleans	Dec.	469	619,172	202,936	931,661	424,901	61,083	11,483	476,842	27,824	1,060,242	113.80	—128,581	—110,977	—148,271	—121,263
	12 mos.	469	6,750,930	2,136,350	10,001,850	2,984,633	2,675,689	115,161	4,117,897	275,833	10,714,177	107.12	—712,327	—1,007,469	—1,376,966	—1,708,349
Spokane International	Dec.	165	105,258	26,051	153,458	23,771	11,944	2,799	44,214	7,281	89,990	58.64	63,468	55,027	45,642	—21,635
	12 mos.	162	1,254,110	246,791	1,566,775	285,027	127,844	30,348	490,595	68,206	1,004,494	64.11	562,281	493,195	406,990	92,476
Spokane, Portland & Seattle	Dec.	549	499,492	203,840	757,150	100,084	94,166	9,126	270,115	24,139	509,886	67.34	247,264	216,927	195,409	254,708
	12 mos.	549	6,089,141	2,352,687	9,154,846	1,851,983	1,271,530	99,400	3,114,657	296,997	6,758,672	73.83	2,396,174	1,330,735	1,158,624	—472,959
Tennessee Central	Dec.	292	157,233	56,213	226,087	27,106	47,515	6,572	139,726	14,591	235,507	104.17	—9,420	15,144	—42,385	1,660
	12 mos.	292	2,079,597	647,867	2,928,925	579,680	635,749	59,812	1,556,144	132,742	2,963,929	101.20	—35,004	—103,161	—429,691	109,755
Term. Railroad Assoc. of St. Louis	Dec.	36	.....	1	395,007	101,198	70,132	1,105	216,754	8,700	402,008	101.77	—7,004	—63,873	68,939	—112,138
	12 mos.	36	.....	8,476	4,758,433	1,039,986	797,792	12,230	2,227,657	109,754	4,241,806	89.14	516,627	27,178	1,544,956	—94,159
East St. Louis Connecting	Dec.	3	.....	.....	156,098	25,307	30,604	365	108,396	3,983	168,654	108.04	—12,556	—15,420	—26,371	—3,113
	12 mos.	3	.....	.....	1,512,770	205,244	347,901	3,712	1,108,360	46,967	1,712,184	113.18	—199,414	—229,264	—383,985	55,730
St. L. Merchants Bridge Term.	Dec.	9	.....	2	405,454	78,276	61,512	1,026	263,958	8,587	413,358	101.95	—7,905	—21,434	—15,448	—28,132
	12 mos.	9	.....	2,881	4,364,016	724,725	732,815	10,760	3,041,809	107,162	4,617,272	105.80	—253,256	—406,985	—368,838	—54,355
St. Louis Transfer Ry.	Dec.	6	.....	.....	132,562	11,967	12,761	248	58,559	2,574	86,109	64.96	46,453	47,926	41,526	16,659
	12 mos.	6	.....	.....	1,395,505	119,502	183,612	2,530	686,270	30,909	1,022,824	73.29	372,682	369,450	286,834	51,937
Texas & Pacific Ry.	Dec.	1,946	2,878,232	1,048,577	4,255,221	546,968	900,904	49,116	1,718,934	104,225	3,357,122	78.89	898,100	649,205	502,145	187,685
	12 mos.	1,946	26,439,271	12,093,999	41,844,190	7,762,424	9,137,927	493,116	18,360,650	1,213,306	37,459,040	89.52	4,385,151	3,039,567	1,474,127	—2,128,329
Toledo, Peoria & Western	Dec.	247	89,230	60,333	160,074	42,397	127,950	5,123	135,463	8,472	319,348	199.50	—159,275	—187,775	—170,269	—117,941
	12 mos.	247	1,217,570	623,898	2,014,008	378,895	619,116	35,897	1,214,931	88,964	2,337,650	116.07	—323,642	—445,642	—262,113	—40,528
Toledo, St. Louis & Western	Dec.	454	935,411	36,094	1,006,064	163,291	213,932	18,985	333,551	31,062	760,819	76.36	245,244	204,244	174,252	71,218
	12 mos.	454	10,429,974	432,305	11,356,935	2,294,272	2,273,786	173,138	4,404,591	200,650	9,345,859	82.29	2,011,076	1,639,631	1,112,643	367,185
Trinity & Brazos Valley	Dec.	368	260,076	30,480	296,815	62,080	53,539	2,796	103,858	13,145	235,405	79.31	61,410	60,705	39,596	39,465
	12 mos.	368	1,843,361	301,278	2,260,170	764,965	668,643	29,174	1,022,682	145,485	2,630,757	116.40	—370,587	—457,401	—531,447	83,198
Ulster & Delaware	Dec.	128	57,823	21,267	103,714	22,724	30,358	2,427	74,940	8,902	140,134	135.12	—36,420	—50,519	—52,473	—18,209
	12 mos.	128	746,677	419,109	1,480,096	272,107	288,753	33,203	1,045,537	93,150	1,740,286	117.58	—260,189	—329,713	—377,419	—224,120
Union R. R. of Pennsylvania	Dec.	45	.....	.....	1,049,066	103,115	269,567	933	630,753	15,324	1,019,692	97.20	29,373	1,781	56,259	211,784
	12 mos.	45	.....	.....	10,977,141	1,058,670	2,664,806	5,051	6,708,064	106,653	10,543,244	96.05	433,898	293,305	1,137,045	719,859
Union Pacific	Dec.	3,614	7,482,943	1,908,480	10,379,154	1,553,699	2,302,662	180,536	3,693,787	371,370	8,400,117	80.93	1,979,037	1,689,647	1,474,730	163,101
	12 mos.	3,614	94,744,005	22,698,764	131,093,304	20,186,907	25,617,613	1,178,133	40,309,392	3,924,358	94,387,205	72.00	36,706,098	30,512,156	30,252,041	—2,838,485
Oregon Short Line	Dec.	2,359	2,635,642	631,726	3,534,721	804,459	645,389	53,788	1,336,055	145,690	3,051,797	86.34	482,924	366,050	341,057	—482,255
	12 mos.	2,354	33,230,313	7,792,340	44,906,044	7,173,546	7,353,603	431,929	14,599,796	1,591,627	32,678,731	72.77	12,827,312	9,464,789	9,645,676	—1,195,208
Oregon Wash. R. R. & Nav. Co.	Dec.	2,223	1,636,580	651,281	2,491,533	873,729	494,028	69,720	1,192,871	163,524	2,830,914	113.62	—33,938	—523,821	—612,726	—359,431
	12 mos.	2,223	22,310,720	7,718,534	33,060,169	7,401,205	5,896,626	542,296	14,368,561	1,632,562	30,283,135	91.60	2,777,034	628,736	—44,979	—3,253,368
St. Joseph & Grand Island	Dec.	258	219,803	40,787	274,922	72,245	57,052	3,591	167,453	17,676	319,531	116.23	—44,609	—62,738	—76,185	—61,026
	12 mos.	258	2,740,699	455,429	3,433,707	1,081,196	570,063	31,314	1,789,451	177,795	3,671,514	106.93	—237,807	—397,385	—466,699	—415,043
Utah	Dec.	98	189,760	685	191,164	25,500	31,032	361	46,277	5,537	108,708	56.87	82,456	71,216	55,670	—17,442
	12 mos.	98	1,993,527	9,312	2,009,520	257,265	368,056	3,248	463,574	38,562	1,130,706	56.27	878,814	796,245	717,020	276,879
Virginian	Dec.	523	1,503,421	100,017	1,720,094	220,881	373,072	9,818	633,083	33,223	1,271,406	73.92	448,688	235,692	297,362	181,881
	12 mos.	523	15,721,329	885,321	18,180,051	2,203,661	3,655,365	100,173	6,494,700	364,929	12,797,414	70.39	5,382,637	4,294,823	4,944,244	2,403,131
Wabash	Dec.	2,472	4,116,104	1,019,242	5,705,328	934,221	1,078,697	119,697	2,658,975	180,656	5,004,987	87.72	700,342	569,310	378,455	294,376
	12 mos.	2,472	43,324,699	11,218,051	59,982,282	10,541,360	14,735,801	1,169,383	30,023,953	1,962,462	58,822,044	98.07	1,160,239	—397,464	—3,759,770	—4,591,009
Western Maryland	Dec.	797	1,731,074	107,361	1,923,772	67,150	536,736	32,582	981,932	57,812	1,692,027	87.95	231,745	176,702	277,572	716,514
	12 mos.	779	17,655,113	1,236,092	20,050,842	3,524,331	6,261,169	456,097	8,795,568	632,601	19,870,598	99.10	180,244	—426,199	675,976	837,510
Western Pacific	Dec.	1,011	861,064	195,298	1,167,223	160,319	205,558	32,817	488,066	61,956	967,687	82.87	199,536	120,431	163,559	—327,057
	12 mos.	1,016	12,480,022	2,623,291	15,981,502	2,630,227	2,502,502	339,938	5,753,973	482,195	12,024,803	75.24	3,956,700	3,178,069	3,404,726	—141,730
Wheeling & Lake Erie	Dec.	511	1,342,967	93,588	1,538,320	278,460	398,052	16,171	696,399	39,496	1,434,138	93.23	104,183	21,708	—88,379	—24,277
	12 mos.	511	15,431,478	893,962	17,916,678	3,063,771	4,523,661	172,681	7,682,679	404,894	15,897,270	88.73	2,019,408	1,098,156	—187,312	—1,121,171

Civil Service Openings for Engineers

The United States Civil Service Commission announces an open competitive examination for senior mechanical engineers, Grade 1, salaries $3,000 to $5,000. A vacancy in the Bureau of Locomotive Inspection and vacancies in positions requiring similar qualifications at salaries ranging from $3,000 to $5,000 will be filled from this examination. Applications should be made on form 1312, which must be filed with the Civil Service Commission, Washington, D. C., not later than March 29.

December Earnings

The net operating income of 188 roads that have thus far reported to the Interstate Commerce Commission for December amounts to only $14,807,000. On this basis the net operating income of all the roads could hardly exceed $20,000,000, whereas to earn 6 per cent on the valuation used by the Interstate Commerce Commission in the rate case the December net operating income should have been approximately $86,000,000. The returns available cover an average mileage of 215,000. The 188 roads had total operating revenues amounting to $482,000,000, which was an increase of 21.6 per cent as compared with December, 1919. Their operating expenses were $437,000,000, an increase of 20.2 per cent, and the net operating income represents an increase of 43.3 per cent as compared with December, 1919. The railroads reporting for the Eastern district had a net operating income of only $1,660,000, those for the Southern district $7,547,000 and those for the Western district $5,599,000. The Western roads had earned over $8,000,000 in December, 1919, but the roads in the other two districts made a better showing in 1920 than in 1919.

Hoover Appoints Committee on Waste

At the meeting of the executive board of American Engineering Council at Syracuse, N. Y., on February 14, Herbert Hoover announced the personnel of the Committee on Elimination of Waste. This is a continuation of the movement started by Mr. Hoover when he was elected president of American Engineering Council. The main points of his plan were outlined in his speech before that body at Washington, D. C., and appearing on page 933 of the November 26, 1920, issue of the *Railway Age*. The men composing the committee are representative of managerial, consultant, educational, editorial and other activities. The committee is as follows: J. Parke Channing, New York, chairman; Dr. Ira N. Hollis, Worcester, Mass.; L. W. Wallace, Baltimore, Md.; H. R. V. Scheel, Passaic, N. J.; L. P. Alford, New York; George D. Babcock, Peoria, Ill.; F. G. Coburn, Bethlehem Shipbuilding Company; Morris L. Cooke, Philadelphia, Pa.; Harrington Emerson, New York; E. E. Hunt, New York; C. E. Knoeppel, New York; Robert Linton, Fred J. Miller, J. H. Williams, New York, and Robert B. Wolf, New York. Mr. Hoover is also a member of this committee.

The council gave formal approval to the action of the committee on procedure requesting that President Harding put an engineer on the Interstate Commerce Commission. The procedure committee was authorized to name six qualified engineers when requested to do so. It was recommended that engineering efforts be extended to the whole question of government reorganization planned under a special congressional committee. The plan for the registration of engineers as presented in the council's report was endorsed and the appointment of another committee was authorized. The Russian Affairs committee was made a new committee on International Relations, the personnel of the old committee being retained. The council decided to recommend to President Harding that an engineer be appointed assistant secretary of war.

While other problems came up at this meeting, such as the betterment of patent office conditions by the passage of the Nolan bill and the establishment of a National Department of Public Works, the work of the meeting was confined chiefly to organizing and getting under way its first big task, that of eliminating economic waste. L. W. Wallace, Philadelphia, Pa., was elected permanent executive secretary and will have full charge of the New York and Washington office of the society. The April meeting of the board will be held in Philadelphia.

Traffic News

A permanent injunction restraining the state of Illinois from interfering with the collection by the railroads of the increased passenger rates was granted by the United States District Court of Appeals at Chicago on February 15.

Postmaster General Burleson has asked Congress for an additional deficiency appropriation of $1,900,000 for the increased railway mail rates for the four months ending June 30, 1920. He had previously obtained an appropriation of $8,000,000 for the period based on an estimate.

At the transportation discussion held by the Traffic Club of Chicago on February 15, H. C. Barlow, R. C. Ross, J. J. Pelley and Samuel O. Dunn addressed the club on the subject of "Railroad Consolidations." Mr. Pelley, a member of the Car Service Commission, discussed the terminal feature of this problem.

The Miami Valley Traffic Club was organized at Dayton, Ohio, on January 25, with a membership of 175. A governing board was elected and on February 7 this board elected officers for the club as follows: W. E. Boyer, district representative, Pennsylvania Lines, Dayton, president; T. T. Webster, traffic manager, G. H. Mead Company, Dayton, vice-president; F. L. Marshall, traffic manager, Pioneer Pole & Shaft Company, Piqua, Ohio, second vice-president; H. T. Ratliff, traffic manager, Champion Coated Paper Company, Hamilton, Ohio, third vice-president; R. B. Mann, fourth vice-president; Maurice T. Otto, traffic manager, Dayton Chamber of Commerce, secretary; and R. H. Hagerman, treasurer.

American Railway Association—Traffic Division

J. E. Fairbanks, General Secretary, announces that the Traffic Division of the American Railway Association has been reorganized and that the membership of the General Committee is as follows:

Representing Traffic Executive Committee, Eastern Territory.—G. H. Ingalls (N. Y. C.); G. D. Dixon (Penn.); Gerrit Fort (B. & M.); F. Zimmerman (C., I. & L.).

Representing Western Traffic Executive Committee.—L. J. Spence (S.P.); H. M. Adams (U. P.); S. G. Lutz (C. & A.); C. E. Perkins (M. P.).

Representing Executive Committee, Southern Freight Rate Association.—Lincoln Green (Southern); R. A. Brand (A. C. L.); J. L. Edwards (A., B. & A.); F. B. Bowes (Ill. Cent.).

G. H. Ingalls is chairman, and J. Gottschalk, secretary, with headquarters at 143 Liberty Street, New York City.

Iowa Legislature Objects to I. C. C. Jurisdiction Over State Rates

Senator Kenyon of Iowa has presented to the Senate a concurrent resolution adopted by the Iowa legislature calling upon Congress "to so amend the transportation act and in such plain language that the authority of the states over intrastate traffic in their respective territories will be maintained without an opportunity for misrepresentation." The resolution says that the Interstate Commerce Commission in its recent decision in the Illinois case interprets the transportation act as giving it "complete authority over the railways, the entire field of transportation, the traffic itself and of the instrumentalities and means of carrying it on." This, the resolution declares, means that "the laws of the states and their officers are defied and that the federal commission has assumed exclusive authority over the railways." It is declared that the freight and passenger rates are already burdensome to the producers and consumers, "with the likelihood that the railroads will ask for further increase in rates, with no consideration apparently having been given in the recent raise in rates to the low cost of construction and operation in the prairie states."

Equipment and Supplies

Locomotives

THE KOPPERS COMPANY, Pittsburgh, Pa., is inquiring for 2 locomotives.

THE TEXAS-MEXICO is inquiring for some 0-6-0 and 4-6-0 type locomotives, to be equipped for burning oil.

Freight Cars

THE WAH CHANG TRADING CORPORATION, Woolworth building, New York, has ordered 20 flat cars of from 12 to 15 tons capacity, from the Magor Car Company, for export to Hong Kong, China.

Iron and Steel

THE LOS ANGELES & SALT LAKE is inquiring for 10,000 tons of rails.

THE GREAT NORTHERN has ordered 11 plate girder spans with a total of 367 tons of steel, from the Wisconsin Bridge & Iron Company.

Railway Construction

AHUKINI TERMINAL & RAILWAY COMPANY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a narrow gage line on the Island of Kanai, Hawaii.

ATCHISON, TOPEKA & SANTA FE HOSPITAL ASSOCIATION.—This company is asking for plans and specifications for a 100-room modern hospital, with two stories and basement and a separate building for a nurses' home at Albuquerque, New Mexico. Dr. J. P. Kaster, Topeka, Kan., is chief surgeon.

CHICAGO UNION STATION.—This company is accepting bids for the construction of a new railway mail terminal between Harrison and Van Buren streets and the Chicago river, Chicago.

GREAT NORTHERN.—This company, which was noted in the *Railway Age* of January 28 (page 308), as accepting bids for the erection of a 500-ton frame coaling station at Troy, Mont., has awarded the contract for this work to the Howlett Construction Company, Moline, Ill.

LOUISVILLE & NASHVILLE.—This Company has awarded a contract to the Union Bridge & Construction Company, Kansas City, Missouri, for the construction of foundations and masonry for a bridge across the Alabama river near Montgomery, Ala.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company contemplates the construction of a brick passenger station and a new freight house at Menasha, Wis., at an estimated cost of approximately $100,000.

MISSOURI, KANSAS & TEXAS.—This company is making location surveys for the line it contemplates building from Austin, Tex., to San Marcos, a distance of 31 miles.

MISSOURI, KANSAS & TEXAS.—This company, which was announced in the *Railway Age* of February 4 (page 349), as accepting bids for the construction of a reinforced concrete inbound freight house at Dallas, Tex., with dimensions 50 ft. by 600 ft., with a second story office, 50 ft. by 100 ft., to cost about $350,000, has awarded the contract for this work to Hickey & Montgomery, Dallas.

OREGON SHORT LINE.—This company contemplates the construction of a new timber-treating plant at Pocatello, Idaho.

THE REGAN AUTOMATIC TRAIN STOP has been tried on the State Railroad of France, under the direction of Joseph Beaumont, chief engineer of the Regan Company.

Supply Trade News

A. E. Brown has been appointed general manager of the railroad department of the **Truscon Steel Company** with headquarters at 22 W. Monroe Street, Chicago.

H. A. Kuehle, who has been engaged in the sale of power apparatus for the **Western Electric Company,** has been placed in charge of railroad sales in the Cleveland office. Mr. Kuehle graduated from the Case School of Applied Science in 1904 and has been with the Western Electric Company since 1914.

Harry L. Oviatt, has been appointed travelling representative of the **Armstrong Manufacturing Company,** Bridgeport, Conn., manufacturers of pipe threading tools and taps. Mr. Oviatt has been with the Bullard Machine Tool Company, Bridgeport, for the past 13 years; for the last 3 years connected with its advertising department.

Alexander England, who has been appointed chief engineer of the **Westinghouse Air Brake Company,** Wilmerding, Pa., as was announced in the *Railway Age* of February 11, has been a member of the Air Brake organization for the past 22 years, and since 1914 he has served as assistant chief engineer. Mr. England was born in Dundee, Scotland, and was indentured at an early age with the Scotch firm of Pierce Brothers, engineers and shipbuilders, to serve an apprenticeship in marine engineering. After having completed his apprenticeship and finished a course of study that earned him a diploma in mechanical engineering from the City and Guilds of London Technical Institute, he entered the service of the Mercantile Steamship Company of London as an engineer in the Mediterranean and Black Sea trade. In 1887 he left the marine service and went to Pittsburgh, Pa., where he took a position as assistant superintendent of the firm of Thomas Carlin's Sons, manufacturers of hoisting engines, brick plant machinery, etc. Later he became superintendent of the Specialty Manufacturing Company, Allegheny, engaged in general machine building. He then went to the Jones & Laughlin Steel Company to assist in the reconstruction of the Eliza furnace plant at Pittsburgh, as engineer in charge of designs for special machinery and equipment for the handling of coal and coke. In 1898 he went to the Westinghouse Air Brake Company to take up special work under the chief engineer, and he has been in the service of the company continuously since that time. He was made chief draftsman in 1905, and remained in that capacity until 1914, when he was appointed assistant chief engineer.

A. England

P. F. Merritt, formerly assistant to purchasing agent, Central region of the Pennsylvania Railroad, in charge of coal purchases, has been elected vice-president of the Eastern Fuel Company, affiliated with the American Coke Corporation, the Georges Creek Coal Mining Company and the Reilly-Peabody Fuel Company. Mr. Merritt's headquarters are at the general offices of the company, Pittsburgh, Pa.

Max Grant, who has been associated with the Tropical Paint & Oil Company, Cleveland, Ohio, has been appointed manager of technical railway sales, of the **Glidden Company,**

Cleveland, and **M. F. Emrich,** formerly vice-president and general manager of the Campbell Paint & Varnish Company, St. Louis, a subsidiary of the Glidden Company, has been appointed general sales manager of the industrial division of the Glidden Company, with headquarters at Cleveland.

N. B. Payne & Co., 25 Church street, New York, dealer in electric cranes and hoists, has extended its lines of material handling machinery to include the portable conveyors of the A. C. Warner Company, Philadelphia, Chicago Automatic Conveyor Company's coal elevators and the McKinney-Harrington Company's package pilers and car loaders. **Edmund Otto,** for several years secretary of the Hardware & Supply Company and prior to that associated with Manning, Maxwell & Moore, Inc., New York, is now associated with N. B. Payne & Co., in this branch of its business.

George J. Blanton, who for the past 4 years has been connected with the engineering sales department of the **Chain Belt Company,** Milwaukee, Wis., has been appointed New York district manager for this company. Mr. Blanton entered the service of the Chain Belt Company in 1917, previous to which he had been, for 8 years, with the General Electric Company, 3 years of which were spent in Schenectady, N. Y., and 5 in the Milwaukee office. Mr. Blanton is a graduate of the University of Michigan, College of Mechanical and Electrical Engineering, class of 1909.

At the annual election of officers of the Concrete Mixer Association of the United States, held at Chicago on January 28, Clifford S. Messinger, general sales manager of the Chain Belt Company, Milwaukee, Wis., was elected president; W. B. Knickerbocker, of the Knickerbocker Company, Jackson, Mich., was elected vice-president and A. T. Scannell of the Archer Iron Works, Chicago, was elected treasurer. H. E. Smith, president of the T. L. Smith Company, Milwaukee, Wis., was made chairman of the executive committee, while P. A. Koehring, secretary of the Koehring Machine Company, Milwaukee, Wis., and Z. W. Carter, sales director of the Austin Machinery Corporation, Chicago, were elected members of the executive committee.

Successful operation during the past year, under the Webb-Pomerene act, is reported by the Locomotive Export Association, New York City, in its annual report to the Federal Trade Commission. Large foreign orders were secured in Belgium and Roumania, and executed at the American plants which are members of the association. The report states that: "We believe the arrangement under which the Locomotive Export Association has been operating proved of decided advantage to the locomotive building industry, and is likely to be of still greater advantage when the locomotive builders of the United States will have to face the keen competition of European builders, which is already making itself manifest in South America and in the Far East."

"Before the war, Great Britain and Germany controlled the European locomotive market," the Commission says in a press notice in this report. "But in recent years the United States has been the only country prepared to ship locomotives in quantity, and our industry has made rapid strides. Total exports of steam locomotives from the United States in the year 1920 numbered 1,711, valued at $53,629,847, showing an increase over the exports in 1919, which were 959, valued at $30,275,728."

Locomotive Superheater Company Takes Over Locomotive Feed Water Heater

The Locomotive Superheater Company, New York, has acquired the patents and business of the Locomotive Feed Water Heater Company, also of New York. Feed water heating and superheating have many factors in common, and logically the former can best be perfected by a combined organization broadly experienced and trained in this field. During the past few years remarkable progress has been made in successfully adapting feed water heaters to locomotives, and if the thermal efficiency of the locomotive is to be further increased the development of the feed water heater should be conducted with a full knowledge of the engineering features of the superheater.

The Locomotive Superheater Company will conduct the further application of the apparatus for preheating feed water through its regular engineering, inspection and service organizations, to which has been added the operating organization of the Locomotive Feed Water Heater Company. This consolidation of resources and effort promises more intensified development and better service to the railroads.

Baldwin Locomotive Works

The annual report of the operations of the Baldwin Locomotive Works for the year ended December 31, 1920, issued on Tuesday of this week shows that the company made a net profit for the year after Federal taxes and charges of $4,428,518. After the deduction of the preferred dividends of $1,400,000, there was a balance of $3,028,518, equal to $15.14 a share on the $20,000,000 common stock as compared with $4,376,243, or $21.88 a share in 1919.

The gross sales for the year were $73,542,666 as compared with $84,307,776 in 1919 and $123,179,251 in 1918. The profit in 1920 after the deduction of manufacturing costs, the addition of other income and the deductions of taxes, other than Federal taxes, etc., was $8,407,269 as against $8,871,243 in 1919. From this profit there was deducted in 1920 an amount of $1,100,000 for Federal taxes and $2,878,751 representing the entire manufacturing profit on the company's credit sales for the year. The item of $1,100,000 for Federal taxes is the smallest for several years—deductions for this purpose in 1919 being $3,095,000 and in 1918 $12,509,817. Dividends on the common stock were paid at the rate of 7 per cent amounting to $1,400,000. The total paid out in dividends in 1919 was $700,000 and in 1918 and 1917 no common dividends were paid.

The consolidated balance sheet of the Baldwin Locomotive Works and Standard Steel Works Company as of December 31, 1920, follows:

Assets		*Liabilities*	
Bald. Loco., 1920, real estate, etc.	$27,439,263	B. L. pf. stock	$20,000,000
Std. Stl., real est., etc.	9,661,333	B. L. common stock	20,000,000
Patents and good will	.....	Bld 1st, m. b.	10,000,000
Investments	377,504	Std. S. 1st m. bonds	2,400,000
Inventories	20,182,280	Accounts payable	10,059,910
Accounts receivable	22,233,358	Bills payable	16,000,000
Bills receivable	6,574,987	Sav. funds	2,113,789
Securities, bonds, etc.	14,809,904	Empl. beneficial ass'n	.....
Cash	1,543,082	Special and Rus. deposit	.....
Miscellaneous	307,351	Advances	.....
Skg. fd. 1st mtge bonds.	1,403,425	Interest	726,564
		Res. for dep. cont., etc.	171,335
		Res. for tax	1,509,961
		Res. for def'd profits	2,878,751
		Sinking fund	2,600,000
		Surplus	16,072,177
Total	$104,532,487	Total	$104,532,487

Obituary

Raymond H. Pilson, third vice-president of The Ajax Metal Company, Philadelphia, Pa., died on February 4.

C. B. Schoenmehl, president and treasurer of the **Waterbury Battery Company,** Waterbury, Conn., died at his home in Waterbury on February 14.

Trade Publications

LOCOMOTIVE CRANES, CRAWLER CRANES AND CRAWLER SHOVELS.—Victor R. Browning, Cleveland, Ohio, has issued three eight-page bulletins describing the line of cranes and shovels and drag-line excavators manufactured by that company. The superstructure of these cranes may be mounted on double trucks or single trucks for operation on standard gage railway tracks or on caterpillar travelers. The use of grab buckets, shovel buckets and drag-line excavators is also illustrated.

BROWNLIE & GREEN, LTD., Manchester, England, have recently reprinted an article by David Brownlie entitled "Exact Data on the Performance of Steam Boiler Plants, Average Figures for the Performance of Some Different Types of Steam Boilers." The author points out that the figures usually taken in practice are entirely erroneous and presents data obtained as a result of investigations during ten years of nearly 500 boiler plants, giving the average figures for different types of boilers.

Railway Financial News

BOYNE CITY, GAYLORD & ALPENA.—*Authority to issue notes.*—This company has been authorized by the Interstate Commerce Commission to issue from time to time within two years, short term promissory notes to the amount of $250,000, payable within two years with interest at 7 per cent, to secure loans to pay maturing short term loans, interest on funded debt, obligations for equipment, taxes and payments on interchange roads.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Authority to issue notes.*—This company has been authorized by the Interstate Commerce Commission to issue its 6 per cent promissory note for $1,000,000 in renewal of a note of like amount to the Chicago & North Western and to repledge $1,200,000 of debenture gold bonds as security therefor.

CENTRAL OF NEW JERSEY.—*Delayed dividend declared.*—A decree filed by Judges Buffington, Woolley and Davis in the Federal District Court at Philadelphia relative to the Lehigh & Wilkes Barre Coal Company (see article entitled Reading Dissolution Plan Filed at Philadelphia, on another page), reads in part as follows:

"It is hereby ordered adjudged and decreed that the decree heretofore entered in this suit and the injunction issued pursuant thereto be and hereby are modified so as to permit the Central Railroad of New Jersey to collect and receive any dividends upon the stock of the Lehigh & Wilkes Barre Coal Company owned by it which have been or may be declared previous to the disposal thereof, pursuant to the directions of this court."

Acting in pursuance of this order the directors have declared the semi-annual dividend of $2 per share, payable February 25 to holders of record February 23. The postponement of the dividend was noted in the *Railway Age* of December 31, 1920, page 1182.

DELAWARE & HUDSON.—*Authority to issue stock.*—This company has been authorized by the Interstate Commerce Commission to issue not to exceed $9,634,000 of common stock to be used for the conversion of its 5 per cent, 20-year convertible gold bonds.

GREAT NORTHERN.—*New Directors.*—W. P. Kenney, of St. Paul, Minn.; E. E. Loomis, president of the Lehigh Valley; Nicholas Terhune and H. F. Smith, of New York, have been elected directors to succeed A. D. Thompson, deceased, of Duluth, Minn.; J. E. Reynolds, A. B. Hepburn and Seward Prosser, of New York. The three last named were compelled to resign because of Section 10 of the Clayton Act.

HOCKING VALLEY.—*Authority to issue bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $2,037,000 of its general mortgage bonds and to pledge $2,220,000 of its general mortgage bonds with the Secretary of the Treasury as security for a loan from the United States.

ILLINOIS CENTRAL.—*Authority to pledge bonds as security for loans.*—This company has been authorized by the Interstate Commerce Commission to pledge from time to time $20,234,000 refunding mortgage 4 per cent gold bonds as security for the payment of current short term loans. Authority was also granted to issue $3,708,000 Illinois Central and Chicago, St. Louis & New Orleans joint first refunding mortgage bonds to reimburse the treasury of the Illinois Central for advances made for additions and betterments to the property of the Chicago, St. Louis & New Orleans and the Canton, Aberdeen & Nashville, and to pledge the bonds as security for short term loans of the Illinois Central.

ILLINOIS SOUTHERN.—*Sale and reorganization.*—See Missouri-Illinois Railway.

MISSOURI-ILLINOIS.—*Application for purchase of another line.*—This company has applied to the Interstate Commerce Commission for an order authorizing the purchase and operation of the railroad and other property of the Illinois Southern Railway to be operated in conjunction with the Mississippi River & Bonne Terre Railroad.

MISSOURI, KANSAS & TEXAS.—*Reorganization plan.*—J. & W. Seligman and Hallgarten & Co., will proceed with the reorganization plan for this company without waiting for the approval of the Dutch bondholders. It is expected that the plan will be filed with the Interstate Commerce Commission within the next two weeks.

MOBILE & OHIO.—*Authority to pledge bonds as security for notes.*—This company has been authorized by the Interstate Commerce Commission to repledge $500,000 of St. Louis Division 5 per cent gold bonds as security for a loan or loans to be represented by short term notes of less than two years' maturity.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Authority to issue bonds.*—This company has been authorized by the Interstate Commerce Commission to sell $495,000 of first consolidated mortgage 5 per cent gold coupon bonds now in its treasury, for the purpose of reimbursing the latter for moneys expended in retirement of underlying bonds.

NORFOLK SOUTHERN.—*Loan approved.*—The Interstate Commerce Commission has approved a loan of $311,000 to aid this road in providing itself with equipment and in making additions and betterments to ways and structures at a total estimated cost of $622,000. The carrier itself is required to finance about $311,000 to meet the loan of the government.

NORFOLK SOUTHERN.—*Authority to pledge bonds and notes as security for loan.*—This company has been authorized by the Interstate Commerce Commission to issue and pledge $222,000 of first lien equipment notes and $200,000 of first and refunding mortgage 50-year gold bonds with the Secretary of the Treasury as security for a loan of $311,000.

PEARL RIVER VALLEY.—*Authority to issue notes.*—This company has been authorized by the Interstate Commerce Commission to issue promissory notes for $25,000 to be dated as of November 3, 1920, and $111,400 to be dated as of the date of issue, to take up outstanding notes, to cover open accounts and to provide funds for construction work in progress.

PITTSBURGH AND LAKE ERIE.—*Authority to issue notes.*—This company has been authorized by the Interstate Commerce Commission to issue $750,000 of six months, 6 per cent promissory notes, dated February 4, 1921, and a similar amount to be dated February 26, 1921, in renewal of notes for like amounts to the Union Trust Company of Pittsburgh.

READING COMPANY.—*Protective Committee for Preferred Stockholders.*—A protective committee composed of Adrian Iselin, R. B. Dodson, trustee of the J. A. Garland estate; E. G. Merrill, president of the New York Life Insurance & Trust Company, and W. A. Law, president of the First National Bank of Philadelphia, all of whom hold or represent substantial amounts of the first and second preferred stocks of the Reading Company, has been formed to protect the rights of the holders of these issues in the forthcoming Reading reorganization. See article on another page of this issue entitled "Reading Dissolution Plan Filed at Philadelphia."

SOUTHERN.—*Authority to issue bonds.*—This company has been authorized by the Interstate Commerce Commission to issue and sell at not less than 80 per cent of par and accrued interest $950,000 of first consolidated mortgage 5 per cent bonds maturing July 1, 1994, for the purpose of retiring a like amount of Virginia Midland serial mortgage 5 per cent bonds, maturing March 1, 1921.

WISCONSIN & NORTHERN.—*Authority to issue notes.*—This company has been authorized by the Interstate Commerce Commission to issue and renew short term notes to the amount of $500,000.

Dividends Declared

CANADIAN PACIFIC.—Common, 2½ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable April 1 to holders of record March 1.

CENTRAL OF NEW JERSEY.—$2, semi-annually, payable February 25 to holders of record February 23.

CINCINNATI NORTHERN.—3 per cent, annually, payable March 1 to holders of record February 21.

CRIPPLE CREEK CENTRAL.—Preferred, 1 per cent, quarterly, payable March 1 to holders of record February 15.

READING COMPANY.—2nd preferred, 1 per cent, quarterly, payable April 14 to holders of record March 28.

SOUTHERN PACIFIC.—$1.50, quarterly, payable April 1 to holders of record February 25.

UNION PACIFIC.—Common, 2½ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable April 1 to holders of record March 12.

Railway Officers

Executive

W. H. Ogborn has been elected president of the Dayton, Toledo & Chicago with headquarters at Dayton, Ohio, succeeding John Ringling.

S. E. Cleage, general manager of the Knoxville, Sevierville & Eastern, with headquarters at Knoxville, Tenn., has been appointed receiver, with the same headquarters, effective Feb. 1.

Financial, Legal and Accounting

J. H. Lane has been elected secretary of the Dayton, Toledo & Chicago succeeding Richard Fuchs.

Parks C. Archer, assistant general claim agent of the Chicago & Alton, with headquarters at Chicago, has been promoted to general claim agent, succeeding J. H. Howard, who has resigned, effective January 20. He was born in Warren County, Mo., on May 2, 1877, and was on the editorial staff of a newspaper at Hannibal, Mo., before engaging in railroad work. He entered railroad service on July 1, 1905, as chief clerk to the district claim agent on the Illinois Central at Memphis, Tenn. A few months later he was promoted to division claim agent and served in that capacity until March 15, 1909, when he was appointed division claim agent on the Chicago & Alton, with headquarters at Mexico, Mo. In September of the same year, he was transferred to Chicago. On November 1, 1912, he was appointed chief clerk to the land, tax and claim agent. Mr. Archer had been serving as assistant general claim agent since February 1, 1917. During the war he was appointed acting general claim agent of the Chicago & Alton, the Chicago, Peoria & St. Louis, the Peoria & Pekin Union, and the Peoria Railroad Terminal Company.

P. C. Archer

Alfred Hermany, whose promotion to assistant general auditor of the Chicago, Rock Island & Pacific, with headquarters at Chicago, was announced in the *Railway Age* of February 11 (page 393), was born at Philadelphia, Pa., on August 29, 1869, and entered railway service in 1884. His first assignment was in the operating department of the Philadelphia & Reading and he later served in the office of the auditor of receipts. He left the service of the Philadelphia & Reading in 1887 to accept employment in the traffic department of the Star Union Line at Philadelphia. In 1891, Mr. Hermany assumed charge of traffic matters on the Pacific Coast Railroad, but after a year of service with this company he was appointed secretary to the president of the Spokane Falls & Northern. He was promoted to assistant auditor of this road in 1895, and four years later was made auditor and assistant manager of the Pacific & Idaho Northern. Mr. Hermany came to the Chicago, Rock Island & Pacific as a clerk on June 22, 1903, and was shortly promoted to chief clerk to the controller. In 1905, he was appointed auditor of passenger traffic, and after seven years of service in this capacity, he was made auditor of disbursements. He was holding this position at the time of his recent promotion.

Operating

C. B. Gorsuch has been appointed superintendent of the Wheeling division of the Baltimore & Ohio with headquarters at Wheeling, W. Va., effective January 1, succeeding E. V. Smith, deceased.

C. F. Urbutt, assistant superintendent of the Iowa and Dakota divisions of the Chicago, Milwaukee & St. Paul with headquarters at Chamberlain, S. D., has been appointed trainmaster of the Iowa division with headquarters at Perry, Ia., succeeding **F. A. Maxwell** who has been transferred to Madison, Wis., effective February 15.

Traffic

H. L. Purdy has been appointed division passenger agent on the Wabash, with headquarters at Buffalo, N. Y., effective February 10.

J. M. Horn, general freight agent of the Canadian National with headquarters at Winnipeg, Man., has been transferred to a similar position at Vancouver, B. C., with supervision over the territory from Lucerne, B. C., west, including the Grand Trunk Pacific Coast Steamship Company, succeeding A. Brostedt, temporarily assigned to other duties.

Mechanical

O. C. Cromwell has been appointed assistant to the chief of motive power and equipment of the Baltimore & Ohio with headquarters at Baltimore, Md., effective February 1.

C. E. McGann has been appointed master mechanic of the Pittsburgh division of the Baltimore & Ohio with headquarters at Glenwood, Pa., effective February 1, succeeding W. C. Burel, resigned.

E. R. Lewis, editor of the Maintenance of Way Cyclopedia, one of the publications of the Simmons-Boardman Publishing Company, has been appointed office engineer of the Michigan Central with headquarters at Detroit, Mich., effective February 15.

J. E. Gould, master mechanic of the Charlotte Harbor & Northern with headquarters at Arcadia, Fla., has been appointed master mechanic of the Cumberland & Manchester with headquarters at Barbourville, Ky. **F. S. Markett** has succeeded Mr. Gould at Arcadia.

G. W. Ray, master mechanic on the Western division of the Chicago & Alton, with headquarters at Slater, Mo., has been transferred to the Northern and Southern divisions, with headquarters at Bloomington, Ill., succeeding M. J. McGraw, who has resigned, effective February 1. **F. Stone** succeeds Mr. Ray.

Obituary

F. C. Donald, commissioner of the Central Passenger Association with headquarters at Chicago, died February 14 at his home in Hubbard Woods, Ill.

E. S. Draper, principal assistant engineer of the Boston & Albany, died at his home in Boston, Mass., on February 6. Mr. Draper was born at Wayland, Mass., on February 19, 1883. After attending the public schools at Wayland he entered Tufts College and was graduated with the class of 1904. In January of the following year he entered the service of the Boston & Albany as a rodman and subsequently served the company in various capacities in the engineering department until March, 1912, when he resigned to become a draughtsman for the Stone & Webster Corporation at Boston. In April, 1913, he re-entered the employ of the Boston & Albany as assistant engineer and was appointed engineer of structures in January, 1918. In May, 1920, he was promoted to principal assistant engineer in which capacity he was serving at the time of his death.